Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis

for Amendment 75 to the Fishery Management Plan for Groundfish in the Bering Sea and Aleutian Islands

Changes in IR/IU Flatfish Requirements

Draft for Secretarial Review

Prepared for the
North Pacific Fishery Management Council

March 2003

northern economics inc.

880 H STREET, SUITE 210, ANCHORAGE, ALASKA 99501
T: 907.274.5600 F: 907.274.5601
E: norecon@norecon.com • www.northerneconomics.com

880 H STREET, SUITE 210,
ANCHORAGE, ALASKA 99501
T: 907.274.5600 F: 907.274.5601

PROFESSIONAL CONSULTING SERVICES IN APPLIED ECONOMIC ANALYSIS

President & Principal Economist: Patrick Burden
Economists: Leah Cuyno, Ph.D., Scott Miller
Associate Economists: Hart Hodges, Ph.D., Donald Schug, Ph.D.
Office Manager: Stephanie Cabaniss

Vice President & Senior Economist: Marcus L. Hartley
Policy Analyst: Nancy Mundy, Ph.D.
Analysts: Michael Fisher, Cal Kerr
Document Processor: Terri McCoy

880 H STREET, SUITE 210, ANCHORAGE, ALASKA 99501
TEL. 907.274.5600 FAX 907.274.5601
E-mail: norecon@norecon.com Internet: www.northerneconomics.com

Contents

Tables:

Figures:

Abbreviations and Acronyms

ABC	Allowable biological catch
ADF&G	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fish and Science Center
AP	Advisory Panel
APAI	Alaska Peninsula and Aleutian Islands
BSAI	Bering Sea and Aleutian Islands
CDQ	Community Development Quota
CEQ	Council on Environmental Quality
CEY	Constant exploitation yield
CFEC	Commercial Fisheries Entry Commission
CFR	Code of Federal Regulations
CPUE	Catch per unit of effort
CRP	Comprehensive Rationalization Program
DMR	Discard mortality rate
DPP	Discards as a percent of product tons
DPR	Discards as a percent of retained catch
DPSEIS	Alaska Groundfish Fisheries Draft Programmatic Supplemental Environmental Impact Statement
DPT	Discard as a percent of total catch
EA	Environmental Assessment
EA/RIR/IRFA	Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis
EEZ	Exclusive Economic Zone
EFH	Essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FMP	Fishery management plan
FONSI	Finding of no significant impact
FR	Federal Register
GOA	Gulf of Alaska
GIS	Geographic information system
HIDPP	High discards as a percent of product tons
HMAP	Halibut Mortality Avoidance Program
IFQ	Individual Fishing Quota
IPHC	International Pacific Halibut Commission
IQF	Individually quick frozen
IRFA	Initial Regulatory Flexibility Analysis
IR/IU	Improved Retention and Improved Utilization

LLP	License Limitation Program
LOA	Length overall
LOWDPP	Low discards as a percent of product tons
MMPA	Marine Mammal Protection Act
MPRSA	Marine Protection, Research, and Sanctuaries Act Title 1.
MRB	Maximum retainable bycatch
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MT	Metric tons
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAA GC	National Oceanic and Atmospheric Administration General Counsel
NPFMC or Council	North Pacific Fishery Management Council
OY	Optimum yield
PSBRC	Prohibited Species Bycatch Reduction Cooperative
PSC	Prohibited species catch
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
RPA	Reasonable and prudent alternative
RSW	Refrigerated sea water
SBA	U.S. Small Business Administration
TAC	Total allowable catch
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VIP	Vessel Incentive Program

Species Aggregation

AMCK	Atka mackerel
OFLT	Other flatfish
OTHR	Other groundfish species (skates, sculpin, squid, and other miscellaneous species)
PCOD	Pacific cod
PLCK	Pollock
ROCK	all Rockfish
RSOL	BSAI Rock sole
SABL	Sablefish
SFLT	GOA Shallow-water flatfish
YSOL	BSAI Yellowfin sole

Sectors/Vessels

APAI-SP	Alaska Peninsula- Aleutian Islands shore plant
BSP-SP	Bering Sea pollock shore plant
CP	Catcher processor
CV	Catcher vessel
FT-CP	Fillet trawl catcher processor
HT-CP	Head and gut trawl catcher processor

INS	Shore plant or inshore floating processor
K-SP	Kodiak shore plant
MS	Mothership
SP	Shore plant
ST-CP	Surimi trawl catcher processor
TCV < 60	Trawl catcher vessels less than 60 feet in length
TCV BSP ≥ 125	Bering Sea pollock trawl catcher vessels greater than or equal to 125 feet in length
TCV BSP 60-124	Bering Sea pollock trawl catcher vessels 60 to 124 feet in length
TCV Div. AFA	Diversified AFA-eligible trawl catcher vessels
TCV Non-AFA	Non-AFA trawl catcher vessels
SC-SP	Southcentral Alaska inshore plant
SE-SP	Southeast Alaska inshore plant
FLT	Floating inshore plant
L-CP	Longline catcher processor
P-CP	Pot catcher processor
CDQ Groups	
APICDA	Aleutian-Pribilof Islands Community Development Association
BBEDC	Bristol Bay Economic Development Corporation
CBSFA	Central Bering Sea Fisherman's Association
CVRF	Coastal Villages Region Fund
NSEDC	Norton Sound Economic Development Corporation
YDFDA	Yukon Delta Fisheries Development Association

Executive Summary

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) assesses alternative actions to address the issue of the improved retention and improved utilization (IR/IU) of yellowfin sole and rock sole in BSAI groundfish fisheries and shallow-water flatfish in GOA groundfish fisheries (Flatfish IR/IU). Specifically, this document assesses the effects of a delay in implementation of flatfish IR/IU requirements which were scheduled to go into effect in January 2003, and considers alternatives to that implementation which are aimed at reducing bycatch (discards) while mitigating expected negative economic impacts to vessels participating in these fisheries. In this document the use of the term "bycatch" is consistent with the MSFCMA definition of bycatch— fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards.

Purpose and Need

In 1997 and 1998 the NPFMC approved amendments implementing IR/IU regulations for pollock and Pacific cod in the BSAI and GOA. These amendments included similar regulations for flatfish species, with implementation specifically delayed until January 1, 2003 in order to provide the industry an opportunity to develop fishing methods and strategies to more effectively avoid catching unwanted flatfish and/or develop new products and markets for the harvested flatfish that were being discarded. Without such a delay the Council determined that this sector would suffer significant adverse economic impacts. However, the full extent to which the IR/IU rules would affect the different sectors of the groundfish fleet that participate in these fisheries had not been determined.

In an effort to balance the need to meet stated NPFMC objectives of ensuring healthy fisheries, reducing discards and waste, and improving utilization of fish resources with the need to minimize the negative effects of regulations on small entities, the NPFMC has recognized the need to conduct additional assessment of the impacts of IR/IU rules for flatfish on such entities and to determine whether a modification of these would minimize such impacts and continue to meet the NPFMC's objectives for fisheries health and resource utilization.

The potential impact of IR/IU rules for flatfish on some sectors of the groundfish fisheries of the BSAI and GOA creates the possibility that some entities currently participating in these fisheries might be compelled to discontinue their participation due to the economic burden the rules could place on their operation. At its June 2002 meeting, the NPFMC developed a problem statement specifically to address the pending implementation of IR/IU regulations for the flatfish fisheries, as follows:

> "100 percent retention of rock sole and yellowfin sole (as currently scheduled) results in severe economic losses to certain participants in the fishery, while less than 100 percent retention of only these species is not enforceable".

Therefore, the Council developed this assessment of alternatives to full retention of flatfish.

Description of the Alternatives

At its June 2002 meeting, the NPFMC adopted a set of final alternatives to be examined in this EA/RIR/IRFA. These alternatives are described below.

Alternative 1: The status quo/no action alternative—the existing IR/IU regulations for flatfish in the BSAI and GOA would be implemented beginning in 2003. These regulations would require that all rock sole and yellowfin sole in the BSAI and all shallow-water flatfish in the GOA (as defined in the annual harvest specifications for the GOA) be retained, and that processors create products that yield at least 15 percent from each fish harvested.

Alternative 2: Revise IR/IU regulations for flatfish—regulations would allow some discards of the IR/IU flatfish species. The percent retention requirement would be set independently for each species

and would range from 50 percent to 90 percent. In addition, the alternative would consider either dropping the retention requirements entirely or requiring 100 percent retention.

Alternative 3: Delay implementation of IR/IU regulations for flatfish—implementation would be delayed for up to three years.

This alternative includes the following trailing amendments:

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.

Amendment B: Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. The purpose of this amendment is to ensure that discarding of flatfish does not increase. In addition, the amendment provides a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.

Amendment C: Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. Each vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Alternative 4: Exempt fisheries from IR/IU flatfish regulations if flatfish discards are less than 5 percent of total groundfish catch—implementation of IR/IU flatfish regulations would take place in 2003 but would apply only to fisheries in which discards of IR/IU flatfish species are 5 percent of total catch or greater. Discards (as opposed to "incidental catch") of IR/IU flatfish species would be calculated as a percentage of total catch, such that credit is awarded for the retention of those species. The use of a rolling average (1-3 years) to calculate the discard rate would be analyzed. A suboption which allows separate exemptions by TAC region, catcher vessels and catcher processors and AFA/Non-AFA vessels would be analyzed.

Preferred Alternative: The Preferred Alternative is a combination of Alternatives 3 and 4, resulting in a two-step process as follows: Step 1 would delay implementation of full retention requirements for flatfish in the BSAI until June of 2004, while Step 2 would develop alternative means to accomplish bycatch (discard) reductions, while maintaining the economic viability of the fleet participating in these fisheries. Implementation of IR/IU flatfish regulations would begin as scheduled in 2003 in the GOA, where adverse impacts are not expected to be significant. The following trailing amendments will be analyzed with the expectation that these amendments could augment or replace IR/IU regulations for flatfish prior to the end of the delay period.

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.

Amendment B: Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. The purpose of this amendment

is to ensure that discards of flatfish do not increase. In addition, the amendment provides a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.

Amendment C: Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. Each vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Amendment D: Establish a regulatory process for the routine review of flatfish discards in the BSAI and GOA fisheries and the exemption of fisheries with less than 5 percent discards of IR/IU flatfish from flatfish retention and utilization rules.

Impacts of the Alternatives

The analysis of impacts examined the effects of the proposed action and alternatives on various components of the human environment. The analysis of the effects on biological and physical resources revealed no significant interactions between the proposed action or alternatives and the natural and physical environment.

With respect to economic and social effects, the analysis of existing conditions revealed that the sectors and target fisheries within sectors that would be potentially affected by IR/IU flatfish rules are those listed in Table ES-1.

Table ES-1. Harvesting and Processing Sectors & Target Fisheries Included in the Impacts Analysis

Harvesting and Processing Sectors	IR/IU Flatfish Species		
	BSAI rock sole	**BSAI yellowfin sole**	**GOA shallow-water flatfish**
Surimi and fillet trawl catcher processors	Pacific cod rock sole	yellowfin sole	none
Head and gut trawl catcher processors	other flatfish Pacific cod pollock rock sole yellowfin sole	other flatfish rock sole yellowfin sole	shallow-water flatfish Pacific cod
Bering Sea pollock shore plants & catcher vessels	Pacific cod	none	none
Alaska Peninsula-Aleutian Islands shore plants & catcher vessels	Pacific cod	none	none
Kodiak shore plants & catcher vessels	none	none	shallow-water flatfish

The impact analysis found that IR/IU rules for flatfish under the status quo will impose direct operational costs on certain sectors of the groundfish fleet that probably cannot be offset (in whole or in part) by expected revenues generated by the sale of the additional catch required to be retained. No quantitative estimate can be made of these costs at present. In general, the impacts on any operation will vary inversely with the size and configuration of the vessel, hold capacity, processing capability, markets, and market access, as well as the specific composition and share of the total catch of the IR/IU flatfish species.

The burden will tend to fall most heavily upon the smallest, least diversified operations, especially smaller head and gut trawl catcher processors. The ability of these vessels to adapt to the IR/IU rules will be further limited due to regulatory actions such as the vessel moratorium, license limitation program and Coast Guard load-line requirements that place severe limits on reconstruction to increase vessel size and/or processing capacity. According to industry representatives, smaller HT-CP vessels would be placed at a significant competitive disadvantage to larger vessels and would likely be forced

to exit or decrease their participation in fisheries with high levels of IRIU flatfish discards because of the vessels' very limited product hold capacity (Northern Economics, Inc. 2002).

For Alternative 2 the analysis examined a range of required retention percentages for each of the IR/IU flatfish species. With respect to impacts on the HT-CP sector, the retention requirement for BSAI RSOL, BSAI YSOL and GOA SFLT would have to be less than 50 percent to avoid impacts in the BSAI Pacific cod fishery. Similarly, the retention requirement for BSAI RSOL would have to be reduced to 50 percent in order to eliminate potential impacts in the BSAI RSOL target fishery. It is also important to note that less than 100 percent retention of IR/IU flatfish species is not enforceable.

By delaying implementation of IR/IU rules for flatfish, Alternative 3 will postpone their severe economic effects on the HT-CP sector and will allow the benefits of the economic activity associated with the operation of these vessels to accrue to vessel operators, crew and fishing communities for the period of the delay.

In examining the economic effects of Alternative 4 the analysis found that all the fisheries in the GOA would be exempt from IR/IU rules. The BSAI fisheries that would not be exempt are the Pacific cod fishery, flathead sole fishery, rock sole fishery and yellowfin sole fishery. If exemption regulations accounted for differences in fishing patterns between trawl catcher processors that are or are not AFA-eligible, the BSAI Pacific cod fishery prosecuted by AFA-eligible trawl catcher processors would be exempt.

The preferred alternative would mitigate the adverse economic effects of IR/IU rules for flatfish on participants in the Alaska groundfish fisheries by delaying implementation of these IR/IU rules in the BSAI fisheries. The postponement will allow the benefits of the economic activity associated with these fisheries to accrue to vessel operators, crew and fishing communities for the period of the delay, and allow time for development of alternatives means to address the bycatch (discards) in these fisheries. The economic effects of implementing IR/IU rules in the GOA fisheries are minimal. Some HT-CP vessels, especially the smaller boats, will likely be forced to exit or decrease their participation in the GOA Pacific cod and shallow-water flatfish fisheries. However, these fisheries account for less than 2 percent of the gross revenues of the HT-CP sector, at present.

1.0 Introduction

The groundfish fisheries in the Exclusive Economic Zone (EEZ) [3 to 200 miles offshore] off Alaska are managed under the Fishery Management Plan for the Groundfish Fisheries of the Gulf of Alaska and the Fishery Management Plan for the Groundfish Fisheries of the Bering Sea and Aleutian Islands Area. Both fishery management plans (FMPs) were developed by the North Pacific Fishery Management Council (NPFMC) under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The Gulf of Alaska (GOA) FMP was approved by the Secretary of Commerce and became effective in 1978, and the Bering Sea and Aleutian Islands Area (BSAI) FMP became effective in 1982.

Actions taken to amend FMPs or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson-Stevens Act, the most important of these are the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA). This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) is intended to satisfy the requirements of these laws and regulations.

NEPA, E.O. 12866, and the RFA require a description of the purpose of and need for the proposed action and a description of alternative actions that may address the problem. This information is included in Section 1 of this document. Section 2 contains information on the affected human environment. Section 3 describes the impacts of the proposed action and alternatives on the human environment as required by NEPA. In addition, this section includes a Regulatory Impact Review (RIR) that addresses the requirement of E.O. 12866 to consider the costs and benefits of the proposed action. Section 4 addresses the requirements of the Magnuson-Stevens Act, the RFA, and other applicable federal laws. Sections 5 and 6 contain lists of preparers and references, respectively.

This EA/RIR/IRFA assesses alternative actions to address the issue of the improved retention and improved utilization (IR/IU) of yellowfin sole and rock sole in BSAI groundfish fisheries and shallow-water flatfish in GOA groundfish fisheries (Flatfish IR/IU). Specifically, this document assesses the effects of a delay in implementation of flatfish IR/IU requirements which were scheduled to go into effect in January 2003, and considers alternatives to that implementation which are aimed at reducing bycatch (discards) while mitigating expected negative economic impacts to vessels participating in these fisheries. In this document the use of the term “bycatch” is consistent with the MSFCMA definition of bycatch— fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards.

1.1 Purpose of and Need for the Action

In 1997 and 1998 the NPFMC approved amendments implementing IR/IU regulations for pollock and Pacific cod in the BSAI and GOA. These amendments included similar regulations for flatfish species, with implementation specifically delayed until January 1, 2003 in order to provide the industry an opportunity to develop fishing methods and strategies to more effectively avoid catching unwanted flatfish and/or develop new products and markets for the harvested flatfish that were being discarded. Without such a delay the Council determined that this sector would suffer significant adverse economic impacts. However, the full extent to which the IR/IU rules would affect the different sectors of the groundfish fleet that participate in these fisheries had not been determined.

In an effort to balance the need to meet stated NPFMC objectives of ensuring healthy fisheries, reducing discards and waste, and improving utilization of fish resources with the need to minimize the negative effects of regulations on small entities, the NPFMC has recognized the need to conduct additional assessment of the impacts of IR/IU rules for flatfish on such entities and to determine whether a

modification of these would minimize such impacts and continue to meet the NPFMC's objectives for fisheries health and resource utilization.

The potential impact of IR/IU rules for flatfish on some sectors of the groundfish fisheries of the BSAI and GOA creates the possibility that some entities currently participating in these fisheries might be compelled to discontinue their participation due to the economic burden the rules could place on their operation. At its June 2002 meeting, the NPFMC developed a problem statement specifically to address the pending implementation of IR/IU regulations for the flatfish fisheries, as follows:

> "100 percent retention of rock sole and yellowfin sole (as currently scheduled) results in severe economic losses to certain participants in the fishery, while less than 100 percent retention of only these species is not enforceable".

Therefore, the Council developed this assessment of alternatives to full retention of flatfish.

1.2 Description of the Alternatives

At its June 2002 meeting, the NPFMC adopted a set of final alternatives to be examined in this EA/RIR/IRFA. These alternatives are described below.

Alternative 1: The status quo/no action alternative—the existing IR/IU regulations for flatfish in the BSAI and GOA would be implemented beginning in 2003. These regulations would require that all rock sole and yellowfin sole in the BSAI and all shallow-water flatfish in the GOA (as defined in the annual harvest specifications for the GOA) be retained, and that processors create products that yield at least 15 percent from each fish harvested.

Alternative 2: Revise IR/IU regulations for flatfish—regulations would allow some discards of the IR/IU flatfish species. The percent retention requirement would be set independently for each species and would range from 50 percent to 90 percent. In addition, the alternative would consider either dropping the retention requirements entirely or requiring 100 percent retention.

Alternative 3: Delay implementation of IR/IU regulations for flatfish—implementation would be delayed for up to three years.

This alternative includes the following trailing amendments:

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.

Amendment B: Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. The purpose of this amendment is to ensure that discarding of flatfish does not increase. In addition, the amendment provides a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.

Amendment C: Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. Each vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Alternative 4: Exempt fisheries from IR/IU flatfish regulations if flatfish discards are less than 5 percent of total groundfish catch—implementation of IR/IU flatfish regulations would take place in 2003 but would apply only to fisheries in which discards of IR/IU flatfish species are 5 percent of total

catch or greater. Discards (as opposed to "incidental catch") of IR/IU flatfish species would be calculated as a percentage of total catch, such that credit is awarded for the retention of those species. The use of a rolling average (1-3 years) to calculate the discard rate would be analyzed. A suboption which allows separate exemptions by TAC region, catcher vessels and catcher processors and AFA/Non-AFA vessels would be analyzed.

Preferred Alternative: The Preferred Alternative is a combination of Alternatives 3 and 4, resulting in a two-step process as follows: Step 1 would delay implementation of full retention requirements for flatfish in the BSAI until June of 2004, while Step 2 would develop alternative means to accomplish bycatch (discard) reductions, while maintaining the economic viability of the fleet participating in these fisheries. Implementation of IR/IU flatfish regulations would begin as scheduled in 2003 in the GOA, where adverse impacts are not expected to be significant. The following trailing amendments will be analyzed with the expectation that these amendments could augment or replace IR/IU regulations for flatfish prior to the end of the delay period.

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.

Amendment B: Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. The purpose of this amendment is to ensure that discarding of flatfish does not increase. In addition, the amendment provides a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.

Amendment C: Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. Each vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Amendment D: Establish a regulatory process for the routine review of flatfish discards in the BSAI and GOA fisheries and the exemption of fisheries with less than 5 percent discards of IR/IU flatfish from flatfish retention and utilization rules.

2.0 Affected Environment

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether a proposed action will result in a significant impact on the human environment. The human environment is defined by the Council on Environmental Quality as the natural and physical environment and the relationships of people with that environment (40 CFR 1508.14). This means that economic or social impacts are not intended by themselves to require preparation of an EA. However, when an EA is prepared and socio-economic and natural or physical environmental impacts are interrelated, the EA must discuss all of these impacts on the quality of the human environment.

If the proposed action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact statement (EIS) must be prepared for major Federal actions significantly affecting the human environment.

An EA must include a discussion of the need for the proposed action, the alternatives considered, the impacts of the proposed action and alternatives on the human environment and a list of document preparers. The purpose is discussed in Section 1.1 of this document, and the alternatives are described in Section 1.2. The list of preparers is in Section 5.0.

This section describes the affected human environment as defined above, including the natural and physical environment (Section 2.1) and the relevant economic and fisheries data pertaining to fisheries in which discarding of IR/IU flatfish species occurs (Section 2.2). The impacts of the proposed action and alternatives are the subject of Section 3.0.

2.1 Natural and Physical Environment

2.1.1 Target and Non-Target Species

This section discusses the flatfish species likely to be affected by the alternatives. These species are both targeted and caught incidentally.

None of the alternatives are expected to have a significant effect on the stocks of IR/IU flatfish. In 2000, 27,330 mt of BSAI rock sole, 14,100 mt of BSAI yellowfin sole and 780 mt of GOA shallow-water flatfish were discarded in fisheries in which these species were targeted or caught incidentally. However, these discard quantities constitute less than one percent of the yellowfin survey biomass, less than two percent of the rock sole survey biomass and less than 0.1 percent of the shallow-water flatfish survey biomass. Eliminating these discard amounts would have no measurable effect on the health of the flatfish resources. Moreover, the species TACs would remain the same under all of the alternatives considered. To the extent that these TACs are sustainable, extraction of the TACs will have the same stock effects regardless of whether all the fish harvested are retained or a large portion of them is discarded. Fisheries data show that the IR/IU flatfish fisheries are currently sustainable. Annual harvests have been below species TACs in recent years, and TACs has been set below ABC estimates. If a portion of those fish discarded survives, then discarding results in fewer fish being removed from the biomass. However, there is no conclusive information regarding how many, if any, of the IR/IU flatfish discarded survive.

2.1.1.1 BSAI Yellowfin Sole

Total biomass and annual specifications of BSAI yellowfin sole are presented in Table 1. The 1997 catch of 181,389 mt was the largest since the fishery became completely domestic. The 2000 and 2001 catches totaled 83,850 mt and 63,395 mt, respectively. The 2000 catch totaled only 44 percent of the ABC and 68 percent of the TAC. The yellowfin sole harvest in 2001 was constrained by two seasonal closures due to the attainment of halibut PSC limits: from April 26-May 21 and from June 11-July 1.

The catch information also includes yellowfin sole discarded in domestic fisheries since their inception in 1987. Discard rates are calculated from weekly observer discard estimates, by target fishery, applied to the weekly 'blend' estimate of retained catch from the NMFS regional office summed over the fishing year. The yellowfin discard rate has ranged from 17 percent of the total catch in 1997 and 2000 to 30 percent in 1992. Discarding occurs primarily in the yellowfin sole directed fishery and in lesser amounts in the rock sole, flathead sole and "other flatfish" fisheries. The amount of yellowfin discarded is less than one percent of the survey biomass (Table 2). Eliminating these discards would have no effect on the health of the resource.

Table 1. Total Biomass, Pre-season Catch Specifications and Total Catches (Including Discards) of Yellowfin Sole in the BSAI

Year	EBS Biomass	BSAI ABC	BSAI TAC	BSAI Catch
		(mt)		
1980	1,842,000	169,000	117,000	87,391
1981	2,394,000	214,500	117,000	97,301
1982	3,377,000	214,500	117,000	95,712
1983	3,535,000	214,500	117,000	108,385
1984	3,141,000	310,000	230,000	159,526
1985	2,443,000	310,000	229,900	227,107
1986	1,909,000	230,000	209,500	208,597
1987	2,613,000	187,000	187,000	181,429
1988	2,402,000	254,000	254,000	223,156
1989	2,316,000	241,000	182,675	153,165
1990	2,183,000	278,900	207,650	80,584
1991	2,393,000	250,600	135,000	96,135
1992	2,172,000	372,000	235,000	146,946
1993	2,465,000	238,000	220,000	105,809
1994	2,610,000	230,000	150,325	144,544
1995	2,009,000	277,000	190,000	124,746
1996	2,298,000	278,000	200,000	130,163
1997	2,163,000	233,000	230,000	181,389
1998	2,329,000	220,000	220,000	95,036
1999	1,306,000	212,000	207,980	67,000
2000	1,581,900	191,000	123,262	83,850
2001	1,855,200	176,000	113,000	63,395

Source: 2001 SAFE Report with the exception of 2001 catch which is from 2001 NMFS Blend Data

Table 2. BSAI Yellowfin Sole Discards in Proportion to Survey Biomass

Year	Survey Biomass (mt)	Retained (mt)	Percent of Biomass	Discards (mt)	Percent of Biomass	Total (mt)	Percent of Biomass
1987	2,613,000	3	0.0	1	0.0	4	0.0
1988	2,402,000	7,559	0.3	2,274	0.1	9,833	0.4
1989	2,316,000	1,279	0.1	385	0.0	1,664	0.1
1990	2,183,000	10,093	0.5	4,200	0.2	14,293	0.7
1991	2,393,000	89,054	3.7	26,788	1.1	115,842	4.8
1992	2,172,000	103,989	4.8	45,580	2.1	149,569	6.9
1993	2,465,000	76,798	3.1	26,838	1.1	103,636	4.2
1994	2,610,000	107,629	4.1	36,948	1.4	144,577	5.5
1995	2,009,000	96,718	4.8	28,022	1.4	124,740	6.2
1996	2,298,000	101,324	4.4	28,334	1.2	129,658	5.6
1997	2,163,000	149,570	6.9	31,818	1.5	181,388	8.4
1998	2,329,000	80,365	3.5	20,836	0.9	101,201	4.3
1999	1,306,000	55,202	4.2	12,118	0.9	67,320	5.2
2000	1,581,900	69,788	4.4	14,062	0.9	83,850	5.3

Source: 2001 SAFE report

2.1.1.2 BSAI Rock Sole

Rock sole are the target of a high value roe fishery occurring in February and March which accounts for the majority of the annual catch (Table 3). The 2000 catch of 49,264 mt was only 21 percent of the ABC of 230,000 mt (36 percent of the TAC). The 2001 catch was 29,255 mt. Thus, rock sole remain lightly harvested in the BSAI. During the 2001 fishing season rock sole harvesting was periodically closed in the BSAI due to halibut bycatch restrictions.

Although female rock sole are highly desirable when in spawning condition, large amounts of rock sole are discarded in the various Bering Sea trawl target fisheries. Since 1987, rock sole have been discarded in greater amounts than they have been retained. Fisheries with the highest rock sole discard rates include the rock sole roe fishery (which discards males and non-roe-bearing females) and the yellowfin sole, Pacific cod and bottom pollock fisheries. Since 1990, the discard rate of rock sole has ranged from 77 percent in 1993 to 55 percent in 2000. The amount of rock sole discarded is less than two percent of the survey biomass (Table 4). Eliminating these discards would have no effect on the health of the resource.

Table 3. Total Biomass, Pre-season Catch Specifications and Total Catches of Rock Sole in the BSAI

Year	EBS Biomass (mt)	BSAI ABC (mt)	BSAI TAC mt)	BSAI Catch (mt)
1980	284,000	N/A	N/A	8,798
1981	302,000	N/A	N/A	9,021
1982	579,000	N/A	N/A	11,844
1983	713,000	N/A	N/A	13,618
1984	799,000	N/A	N/A	18,750
1985	700,000	N/A	N/A	37,678
1986	1,031,000	N/A	N/A	23,483
1987	1,270,000	N/A	N/A	40,046
1988	1,480,000	N/A	N/A	86,366
1989	1,139,000	171,000	90,762	68,912
1990	1,381,000	216,300	60,000	35,253
1991	1,588,000	246,500	90,000	46,681
1992	1,543,000	260,800	40,000	51,956
1993	2,123,000	185,000	75,000	64,260
1994	2,894,000	313,000	75,000	60,584
1995	2,175,000	347,000	60,000	55,083
1996	2,183,000	361,000	70,000	47,146
1997	2,711,000	296,000	97,185	67,564
1998	2,169,000	312,000	100,000	33,454
1999	1,689,000	309,000	120,000	40,000
2000	2,127,000	230,000	137,760	49,264
2001	2,415,000	228,000	75,000	29,255

Source: 2001 SAFE report with the exception of 2001 catch data which are from 2001 NMFS blend data

Table 4. BSAI Rock Sole Discards in Proportion To Survey Biomass

Year	Survey Biomass (mt)	Retained (mt)	Percent of Biomass	Discards (mt)	Percent of Biomass	Total (mt)	Percent of Biomass
1987	1,270,000	14,209	1.12	14,701	1.16	28,910	2.28
1988	1,480,000	22,374	1.51	23,148	1.56	45,522	3.08
1989	1,139,000	23,544	2.07	24,358	2.14	47,902	4.21
1990	1,381,000	12,170	0.88	12,591	0.91	24,761	1.79
1991	1,588,000	25,406	1.60	35,181	2.22	60,587	3.82
1992	1,543,000	21,317	1.38	35,681	2.31	56,998	3.69
1993	2,123,000	22,589	1.06	45,669	2.15	68,258	3.22
1994	2,894,000	20,951	0.72	39,945	1.38	60,896	2.10
1995	2,175,000	21,761	1.00	33,108	1.52	54,869	2.52
1996	2,183,000	19,770	0.91	27,158	1.24	46,928	2.15
1997	2,711,000	27,743	1.02	39,821	1.47	67,564	2.49
1998	2,169,000	12,645	0.58	20,999	0.97	33,644	1.55
1999	1,689,000	15,224	0.90	25,286	1.50	40,510	2.40
2000	2,127,700	22,151	1.04	27,113	1.27	49,264	2.32

Source: 2001 SAFE report

2.1.1.3 GOA Shallow-water Flatfish

The "flatfish" species complex has been managed as a unit in the Gulf of Alaska and includes the major flatfish species inhabiting the region with the exception of Pacific halibut. The major species, which account for 98 percent of the current biomass, are flathead sole (*Hippoglossoides elassodon*), rock sole (*Pleuronectes bilineatus*), rex sole (*Errex zachirus*), Dover sole (*Microstomus pacificus*), yellowfin sole (*Pleuronectes asper*) and starry flounder (*Platichthys stellatus*).

In 1990, the flatfish assemblage was separated into four categories for management: shallow-water flatfish, deep-water flatfish, flathead sole and arrowtooth flounder. This classification was made because of the significant differences in halibut catch rates in fisheries targeting shallow-water and deep-water flatfish species.

Deep-water flatfish include Dover sole *Microstomus pacificus*, Greenland turbot *Reinhardtius hippoglossoides* and deep-sea sole *Embassichthys bathybius.* Shallow-water flatfish include northern rock sole *Lepidopsetta perarcuata*, southern rock sole *Pleuronectes bilineatus*, yellowfin sole *Pleuronectes asper*, starry flounder, butter sole *Pleuronectes isolepis*, English sole *Pleuronectes vetulus*, Alaska plaice *Pleuronectes quadrituberculatus* and sand sole *Psettichthys melanostictus*.

Arrowtooth flounder, because of its present high abundance and low commercial value, was separated from the group and managed under a separate ABC. Flathead sole were likewise assigned a separate ABC since they overlap the depth distributions of the shallow-water and deep-water groups. In 1993, rex sole was split out of the deep-water management category because of concerns regarding Pacific ocean perch catch in the rex sole target fishery.

The flatfish resource was lightly to moderately harvested in 2001. The 2001 shallow-water flatfish fishery was open from Jan. 10-April 27, May 21-May 26, June 10-June 27, July 1-August 4 and September 1-September 5. All closures were due to the attainment of the halibut PSC limit. The shallow-water flatfish fishery was then closed for the rest of the year on October 21 due to reaching the halibut PSC limit.

Shallow-water flatfish catches increased from 2,577 mt in 1999 to 6,928 mt in 2000, then decreased to 6,162 mt in 2001. The flatfish fishery is likely to continue to be limited by the potential for high catches of halibut. Estimates of retained and discarded catch in the various trawl target fisheries since 1991, by management assemblage, were calculated from discard rates observed from at-sea sampling and industry reported retained catch (Table 5). Flatfish retention ranged from 73 percent for deep-water flatfish to 97 percent for rex sole in the 2000 fishery. The retention rates for shallow-water flatfish are relatively high. Discards of shallow-water flatfish are expected to be less than 0.1 percent of the survey biomass. Eliminating these discards would have no effect on the health of the resource.

Table 5. Percent Retained Catch for the Gulf of Alaska Flatfish Fisheries

Species	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Flathead sole	59	66	66	67	71	77	83	83	62	83
Deep-water Flatfish*			90	75	79	72	82	90	80	73
Shallow-water Flatfish			82	73	71	86	81	83	77	88
Rex Sole				89	90	95	92	97	96	97

Source: 2001 SAFE report

2.1.2 Prohibited Species

Prohibited species in the groundfish fisheries include Pacific salmon (chinook, coho, sockeye, chum and pink), steelhead trout, Pacific halibut, Pacific herring and Alaska king, Tanner and snow crab. The most recent review of the status of crab stocks may be found in the crab SAFE report. The status of other prohibited species is described in Section 3.5 of the Steller sea lion protection measures SEIS (NMFS 2001b). The effects of the groundfish fisheries in the BSAI and GOA on prohibited species are primarily managed by conservation measures developed and recommended by the NPFMC over the entire history of the FMPs for the BSAI and GOA and implemented by federal regulation. These measures include prohibited species catch (PSC) limits on a year round and seasonal basis, year round and seasonal area closures, gear restrictions and an incentive plan to reduce the incidental catch of prohibited species by individual fishing vessels. None of the alternatives affects management of prohibited species, nor or they likely to affect catch of prohibited species.

2.1.3 Forage Fish Species

The species referred to as forage fish species are limited to those species included in BSAI groundfish FMP Amendment 36 and GOA groundfish FMP Amendment 39. Management concerns with regard to forage fish, as well as current and planned research to address these concerns, are discussed in Section 4.5 of the 2001 DPSEIS (NMFS 2001a). Estimates of biomass and seasonal distribution of biomass are unavailable for forage fish species, although none of the alternatives considered are expected to have any adverse effects on forage fish species.

2.1.4 Benthic Habitat and Essential Fish Habitat

The 2001 DPSEIS (NMFS 2001a) describes the effects of commercial groundfish fishing on substrate and benthic habitat. All the marine waters and benthic substrates in the management areas comprise the habitat of groundfish. In addition, the adjacent marine waters seaward of the EEZ, adjacent State waters, shoreline, freshwater inflows and atmosphere above the waters constitute habitat for prey species, other life stages and species that move in and out of, or interact with, groundfish species. Distinctive aspects of the habitat include water depth, substrate composition, substrate infauna, light penetration, water chemistry (salinity, temperature, nutrients, sediment load, color, etc.), currents, tidal action, phytoplankton and zooplankton production, associated species, natural disturbance regimes and the seasonal variability of each aspect. Substrate types include bedrock, cobbles, sand, shale, mud, silt and various combinations of organic material and invertebrates that may be termed biological substrate. Biological substrates present in management areas include corals, tunicates, mussel beds and tubeworms. Biological substrate has the aspect of ecological state (from pioneer to climax) in addition to the organic and inorganic components. Ecological state is heavily dependant on natural and anthropogenic disturbance regimes. The BSAI and GOA groundfish FMPs contain descriptions of habitat preferences of the target species, and projects are underway to systematically present biological requirements for each known life history stage.

The marine habitat may be altered by changes in the amount and flow of energy with the removal and return (discarding) of fish in fisheries. In the eastern Bering Sea total catch biomass (including non-groundfish removals) is estimated to be one percent of the total system biomass (excluding dead organic material).

Auster and Langton (1999) reviewed the indirect effects of commercial fishing on EFH. Data are lacking on the spatial extent of commercial fishing-induced disturbance, the effects of specific gear types along a gradient of commercial fishing effort and the linkages between habitat characteristics and the population dynamics of fishes. Trawling on sea floor habitat and benthic communities in the GOA

generally disturb sea floor habitats by displacing boulders, removing epifauna, decreasing the density of sponges and anthozoans and damaging echinoderms. However, the effect of this disturbance on fish and other living marine resources is not known.

A detailed analysis of interactions between groundfish fisheries and benthic habitat and EFH is provided in the 2001 DPSEIS (NMFS 2001a) and the EA for the 2002 TAC specifications for Alaska groundfish fisheries (NMFS 2001c). These analyses also provide the information necessary for an EFH (Essential Fish Habitat) assessment, which is required by the Magnuson-Stevens Act for any action that may adversely affect EFH.

None of the alternatives would be expected to adversely affect marine benthic habitat or EFH in any manner or to any extent not already addressed in previous NEPA analyses. The alternatives would not change the species TACs or the gear type and general location of the fisheries in which IR/IU flatfish are caught.

2.1.5 Ecosystem Considerations

The 2001 DPSEIS (NMFS 2001a) provides updated information on biodiversity, essential fish habitat, sustainable yields and human considerations as they relate to the BSAI and GOA marine ecosystems. This information is to be used in making ecosystem-based management decisions such as establishing ABC and TAC levels.

Total commercial fishing removals in the BSAI and GOA are a small proportion of the total system energy budget and are small relative to internal sources of inter-annual variability in production. Energy flow paths do not seem to be redirected by discards and offal. Before improved retention requirements for Pacific cod and pollock were in place it was estimated that the total offal and discard production was one percent of the estimated unused detritus going to the ocean bottom. The level of discards relative to natural sources of detritus and the absence of evidence that would relate changes in scavenger populations to discard trends suggest that the BSAI and GOA groundfish fisheries have insignificant ecosystem impacts through energy removal and redirection (NMFS 2000b).

High rates of discards can have potential ecosystem effects. The discards could affect scavenger and predator populations by increasing the available food supply. In addition, discards will contribute to the total energy flow and, though they may be small when compared to the total flow, their effect is cumulative with other forms of energy flow such as offal production from processing and naturally occurring detritus. However, the level of IR/IU flatfish discards relative to natural sources of detritus and the absence of evidence that would relate changes in scavenger populations to discard trends suggest that IR/IU flatfish discards have insignificant ecosystem impacts through energy removal and redirection.

To the extent that IR/IU flatfish discards are concentrated in one area they could create localized ecosystem effects. The potential for such effects may require consideration of local energy flows rather than region-wide flows. Such localized ecosystem effects are currently not well understood.

2.1.6 Endangered or Threatened Species

The Endangered Species Act of 1973 as amended (16 U.S.C. § 1531 *et seq*), provides for the conservation of endangered and threatened species of fish, wildlife and plants. The program is administered jointly by the NMFS for most marine mammal species, marine and anadromous fish species and marine plants species, and by the USFWS for bird species and terrestrial and freshwater wildlife and plant species.

The designation of an ESA listed species is based on the biological health of that species. The status determination is either threatened or endangered. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. § 1532(20)]. Endangered species are those in danger

of becoming extinct throughout all or a significant portion of their range [16 U.S.C. § 1532(20)]. Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NMFS, is authorized to list marine fish, plants and mammals (except for walrus and sea otter) and anadromous fish species. The Secretary of the Interior, acting through the USFWS, is authorized to list walrus and sea otter, seabirds, terrestrial plants and wildlife and freshwater fish and plant species.

In addition to listing species under the ESA, the critical habitat of a newly listed species is designated concurrent with its listing to the "maximum extent prudent and determinable" [16 U.S.C. § 1533(b)(1)(A)]. The ESA defines critical habitat as those specific areas that are essential to the conservation of a listed species and that may be in need of special consideration. Federal agencies are prohibited from undertaking actions that destroy or adversely modify designated critical habitat. Some species, primarily the cetaceans, which were listed in 1969 under the Endangered Species Conservation Act and carried forward as endangered under the ESA, have not received critical habitat designations.

Federal agencies have an affirmative mandate to conserve listed species. Federal actions, activities or authorizations (hereafter referred to as Federal action) must be in compliance with the provisions of the ESA. Section 7 of the ESA provides a mechanism for consultation by the Federal action agency with the appropriate expert agency (NMFS or USFWS). Informal consultations, resulting in letters of concurrence, are conducted for Federal actions that may affect, but are not expected to adversely affect, listed species or critical habitat. A consultation conducted under Section 7 of the ESA, resulting in a biological opinion, is conducted for a Federal action that may have an adverse affect on the listed species. Through the biological opinion, a determination is made as to whether the proposed action is likely to jeopardize the continued existence of a listed species (jeopardy) or destroy or adversely modify critical habitat (adverse modification). If the determination is that the action proposed (or ongoing) will cause jeopardy, reasonable and prudent alternatives may be suggested which, if implemented, would modify the action to avoid the likelihood of jeopardy to the species or destruction or adverse modification of designated critical habitat. A biological opinion with the conclusion of no jeopardy may contain conservation recommendations intended to further reduce the negative impacts to the listed species. These conservation recommendations are advisory to the action agency [50 CFR 402.25(j)]. If a likelihood exists of any taking[1] occurring during promulgation of the action, an incidental take statement may be appended to a biological opinion to provide for the amount of take that is expected to occur from normal promulgation of the action.

Species currently listed as endangered or threatened under the ESA that may be present in the BSAI and GOA are presented in Table 6. The group includes great whales, pinnipeds, Pacific salmon and steelhead and seabirds. Of the species listed under the ESA and present in the action area, some may be negatively affected by groundfish commercial fishing. NMFS is the expert agency for ESA listed marine mammals and anadromous fish species. The USFWS is the expert agency for ESA listed seabirds. The fisheries as a whole must be in compliance with the ESA.

[1] The term "take" under the ESA means "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct" [16 U.S.C. § 1538(a)(1)(B)].

Table 6. ESA Listed Species in the BSAI and GOA

Common Name	Scientific Name	ESA Status
Northern Right Whale	*Balaena glacialis*	Endangered
Bowhead Whale [1]	*Balaena mysticetus*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Blue Whale	*Balaenoptera musculus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Snake River Sockeye Salmon	*Onchorynchus nerka*	Endangered
Short-tailed Albatross	*Phoebaotria albatrus*	Endangered
Steller Sea Lion	*Eumetopias jubatus*	Endangered and Threatened [2]
Snake River Fall Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Snake River Spring/Summer Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Puget Sound Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Lower Columbia River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Willamette River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Columbia River Spring Chinook Salmon	*Onchorynchus tshawytscha*	Endangered
Upper Columbia River Steelhead	*Onchorynchus mykiss*	Endangered
Snake River Basin Steelhead	*Onchorynchus mykiss*	Threatened
Lower Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Upper Willamette River Steelhead	*Onchorynchus mykiss*	Threatened
Middle Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Spectacled Eider	*Somateria fishcheri*	Threatened
Steller Eider	*Polysticta stelleri*	Threatened

[1] The bowhead whale is present in the Bering Sea area only.
[2] Steller sea lion are listed as endangered west of Cape Suckling and threatened east of Cape Suckling.

Section 7 consultations with respect to the actions of the Federal groundfish fisheries have been done for all the species listed above, either individually or in groups. An FMP-level biological opinion was prepared in November 2000 which resulted in significant changes to management of the pollock, Pacific cod, and Atka mackerel fisheries to accommodate concerns over fisheries interactions with Steller sea lions. The most recent Section 7 consultation and Biological Opinion (November 2001) evaluated all groundfish fisheries under the existing management regime, and concluded that the groundfish fisheries, as constituted, did not result in jeopardy or adverse modification. Flatfish species, while present in the diet of sea lions, do not constitute a significant prey source, and the fisheries for flatfish do not typically occur in the areas of sea lion critical habitat.

Therefore, none of the alternatives would be expected to adversely affect endangered or threatened species in any manner or to any extent not already addressed in previous consultations conducted under Section 7 of the ESA. None of the alternatives would change the TACs for IR/IU flatfish, the gear types used in the fisheries in which IR/IU flatfish are discarded, or the spatial or temporal distribution of these fisheries. Therefore, none of the alternatives are expected to have a significant impact on endangered or threatened species.

2.1.7 Impacts on Other Marine Mammals

Marine mammals not listed under the ESA that may be present in the BSAI and GOA include cetaceans [minke whale (*Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), Dall's porpoise *(Phocoenoides dalli*), harbor porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*) and the beaked whales (e.g., *Berardius bairdii* and *Mesoplodon spp*.)] and pinnipeds

[northern fur seals (*Callorhinus ursinus*) and Pacific harbor seals (*Phoca vitulina*)] and the sea otter (*Enhydra lutris*).

Direct and indirect interactions between marine mammals and groundfish harvest occur due to overlap in the size and species of groundfish harvested in the fisheries that are also important marine mammal prey and due to temporal and spatial overlap in marine mammal foraging and commercial fishing activities. A detailed analysis of interactions between groundfish fisheries and marine mammals is provided in the 2001 DPSEIS (NMFS 2001a), Steller sea lion protection measures SEIS (NMFS 2001b) and EA for the 2002 TAC specifications for Alaska groundfish fisheries (NMFS 2001c).

None of the alternatives would be expected to adversely affect marine mammal, because none of the alternatives would change the TACs for IR/IU flatfish, the gear types used in the fisheries in which IR/IU flatfish are discarded, or the spatial or temporal distribution of these fisheries, relative to the presence of these marine mammal species.

2.1.8 Seabirds

In 1999, the U.S. Fish and Wildlife Service (USFWS) issued a biological opinion on the BSAI hook-and-line groundfish fishery and the BSAI trawl groundfish fishery for the endangered short-tailed albatross, pursuant to Section 7 of the ESA. The conclusion of the biological opinion continued a no jeopardy determination and the incidental take statement expressing the requirement to immediately reinitiate consultations if incidental takes exceed four short-tailed albatross over a two year period. Consultations on the short-tailed albatross were not re-initiated for the year 2000 TAC specifications because the 1999 biological opinion extended through the end of calendar year 2000. In September 2000, NMFS requested re-initiation of consultation for all listed species under the jurisdiction of the USFWS, including the short-tailed albatross, spectacled eider and Steller's eider for the GOA FMP and 2001-2004 TAC specifications. Based upon a review of the fishery action and the consultation material provided to USFWS, NMFS concluded that the GOA groundfish fisheries are not likely to adversely affect either the spectacled eider or the Steller's eider or destroy or adversely modify the critical habitat that has been proposed for each of these species.

None of the alternatives would be expected to adversely affect seabirds in any manner or to any extent not already addressed in previous consultations conducted under Section 7 of the ESA.

2.2 Economic and Social Conditions

This section contains discussions of the existing economic and social conditions of affected portions of the human environment.

2.2.1 Economic Conditions of Particular Relevance to IR/IU Flatfish Rules

This section provides a summary of fishery-wide data as an overview of existing economic conditions in the fisheries with a focus on issues related to the IR/IU flatfish rules. This overview will be followed by a sector-level analysis of catch and discards of the IR/IU flatfish species. The sector-level analysis will identify sectors and target fisheries that have not had significant catches and/or discards of IR/IU flatfish in recent years. Following the sector-level analysis is a summary of an analysis of fixed-gear catcher vessels and an analysis of discards as a percent of product tons. The various analyses presented in this section will assist in the identification of the sectors and target fisheries likely to be affected by IR/IU flatfish rules.

The source of the data used in this analysis is the NPFMC's fisheries sector profile database. This database contains Alaska Department of Fish and Game (ADF&G) groundfish fish ticket data blended with observer and weekly production report data for catcher processors and inshore processing plants.

The weekly production report data for inshore plants reflect catch deliveries made to the plant from catcher vessels in the various target fisheries.

Table 7 defines the species aggregations used in the analysis that follows. Each of these species aggregations represents a species grouping and a target fishery for that species group.

Table 7. Species Aggregations

ACRONYM	SPECIES AGGREGATIONS
AMCK	Atka mackerel
OFLT	All other flatfish with the exception of IR/IU Flatfish. In this analysis OFLT includes arrowtooth flounder, Greenland turbot, flathead sole, deep-water flatfish and "other flatfish"
OTHR	other groundfish species (skates, sculpin, squid and other miscellaneous species)
PCOD	Pacific cod
PLCK	Pollock
ROCK	all rockfish
RSOL	BSAI rock sole
SABL	Sablefish
SFLT	GOA shallow-water flatfish (rock sole, yellowfin sole, butter sole, English sole, starry flounder, Petrale sole, sand sole, Alaska plaice and "general" flounders
YSOL	BSAI yellowfin sole

Table 8 provides definitions of each processing sector and the analysis of these sectors follows thereafter.

Table 8. Processor Groupings Identified for Sector and Regional Profiles

ACRONYM	INSHORE PROCESSOR AND MOTHERSHIP CLASSES (all mutually exclusive)
BSP-SP	Bering Sea pollock inshore plant
APAI-SP	Alaska Peninsula and Aleutian Islands inshore plant
K-SP	Kodiak inshore plant
SC-SP	Southcentral Alaska inshore plant
SE-SP	Southeast Alaska inshore plant
FLT	floating inshore plant
MS	mothership
ACRONYM	**CATCHER PROCESSOR CLASSES** (all mutually exclusive)
ST&FT-CP	surimi trawl and fillet trawl catcher processors combined
HT-CP	head and gut trawl catcher processor
L-CP	longline catcher processor
P-CP	pot catcher processor

Table 9 through Table 17 provide aggregated historical data from all processors that have participated in the BSAI and GOA groundfish target fisheries from 1992-2000. These processors include BSAI and GOA trawl catcher processors, shore plants, motherships and floating processors.

Table 9 presents data on the number of processors from all sectors that have historically participated in processing in each BSAI and GOA groundfish target fishery. Historically, the largest participation numbers have been in the PCOD fishery. The AMCK and GOA SFLT fisheries have had the smallest levels of processor participation. The participation data also show a general trend of decreasing participation since the early to mid 1990s. The total number of processors participating in all BSAI and GOA groundfish fisheries has decreased from 216 in 1992 to 161 in 2000. Among the IR/IU flatfish species, the YSOL target fishery has had the highest participation, except in 1993 when the RSOL target fishery had the highest participation level.

The target fisheries for the IR/IU flatfish show similar decreasing trends in total participation since the mid-1990s. Participation in the RSOL target fishery declined from 39 in 1995 to 21 in 1998. During this same period, participation in the YSOL target fishery decreased from 50 to 26. Participation in the GOA shallow-water flatfish fishery decreased from 18 in 1995 to a period low of 8 in 1999.

Table 9. Number of Processors Participating in BSAI and GOA Target Fisheries, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	SFLT	YSOL	Total
Year	Number of Processors										
1992	30	51	61	172	85	67	39	89	18	57	216
1993	23	97	41	138	78	60	39	107	19	33	191
1994	17	60	13	133	69	48	34	123	11	41	192
1995	18	94	21	142	71	58	39	87	18	50199	
1996	18	76	34	135	59	67	31	70	16	38	184
1997	12	72	25	129	52	57	30	59	15	34	172
1998	13	65	28	120	55	59	21	58	14	26	162
1999	17	67	26	124	44	65	22	62	8	29	153
2000	13	64	27	131	45	57	28	68	12	28	161

Source: NPFMC Sector Profile Database, 2001.

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and “other flatfish”.

Table 10 presents the wholesale value of production by species for all processing sectors combined from 1992 through 2000. These values represent the contribution of each species to the total wholesale value regardless of which target fishery it may have been caught in. In total value, the BSAI and GOA groundfish fisheries depicted here were worth over $1.4 billion in 1992, but have had fluctuations in total value since then. In 2000, the total wholesale value of these fisheries was just under $1.4 billion. The wholesale value of PLCK is the largest component of total wholesale value in every year and is generally between two to four times larger than the PCOD value, which is the next highest value species. Sablefish is the third largest species in terms of wholesale value.

The wholesale values of IR/IU flatfish have historically been considerably smaller than those of PLCK, PCOD or SABL. The wholesale value of SFLT has fluctuated. The high value from 1992 to 2000 was $10.24 million in 1996. In 1999, the value was $1.82 million, but it rose to $7.68 million by 2000. BSAI rock sole also has fluctuated in value and generally trended downward in the late 1990s. The wholesale value for RSOL was $15.83 million in 2000, which is less than half the high value of $43.66 million recorded in 1994. Among the IR/IU species of concern, BSAI yellowfin sole has historically had the greatest wholesale value. However, the wholesale value of YSOL fell to a low of $19.77 million in 1999 compared with the high of $68.32 million in 1997. In 2000, the total value increased to $24.67 million.

The IR/IU flatfish have historically accounted for a small share of the total value of the BSAI and GOA groundfish fisheries. The GOA SFLT complex has contributed less than 1 percent of the total value in every year from 1992-2000. The contribution of BSAI rock sole has not exceeded 3 percent over that period and dropped to 1.1 percent in 2000. The contribution of YSOL has fluctuated over the years with a high of 5.7 percent in 1997 and a low of 1.6 percent in 1999. Though their contribution is small in percentage terms, these fisheries have had a combined wholesale value of as much as $100 million in the early 1990s. However, these values have fallen in recent years. In 2000, the combined wholesale value of IR/IU flatfish was $48.18 million.

Table 10. Wholesale Value of Production by Species for All Processors, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	SFLT	YSOL	Total
Year	**Wholesale Value of Production ($Millions)**										
1992	46.38	15.30	0.60	223.90	925.43	35.73	33.06	90.09	7.54	49.71	1,427.73
1993	53.97	28.12	0.52	145.38	555.48	28.11	32.15	96.71	7.46	47.69	995.59
1994	30.24	29.41	0.74	153.10	674.70	20.33	43.66	114.35	3.89	58.26	1,128.69
1995	44.26	38.03	0.76	217.83	850.33	30.98	31.09	110.07	7.09	60.65	1,391.09
1996	68.74	47.97	0.82	225.11	678.53	26.16	28.55	96.73	10.24	48.43	1,231.27
1997	36.70	33.02	1.21	226.08	686.93	24.40	26.70	89.57	6.44	68.32	1,199.37
1998	18.36	39.57	0.40	228.59	632.86	19.56	14.11	65.41	3.84	27.87	1,050.56
1999	22.95	36.14	0.40	306.38	720.74	21.62	14.82	70.44	1.82	19.77	1,215.09
2000	19.91	44.04	0.99	314.19	863.64	18.38	15.83	83.47	7.68	24.67	1,392.79
Year	**Wholesale Value of Production (Percent of Total)**										
1992	3.2	1.1	0.0	15.7	64.8	2.5	2.3	6.3	0.5	3.5	100.0
1993	5.4	2.8	0.1	14.6	55.8	2.8	3.2	9.7	0.7	4.8	100.0
1994	2.7	2.6	0.1	13.6	59.8	1.8	3.9	10.1	0.3	5.2	100.0
1995	3.2	2.7	0.1	15.7	61.1	2.2	2.2	7.9	0.5	4.4	100.0
1996	5.6	3.9	0.1	18.3	55.1	2.1	2.3	7.9	0.8	3.9	100.0
1997	3.1	2.8	0.1	18.9	57.3	2.0	2.2	7.5	0.5	5.7	100.0
1998	1.7	3.8	0.0	21.8	60.2	1.9	1.3	6.2	0.4	2.7	100.0
1999	1.9	3.0	0.0	25.2	59.3	1.8	1.2	5.8	0.2	1.6	100.0
2000	1.4	3.2	0.1	22.6	62.0	1.3	1.1	6.0	0.6	1.8	100.0

Source: NPFMC Sector Profile Database, 2001.

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Table 10 provides historical wholesale values by target fishery of all processors in the BSAI and GOA groundfish fisheries. These numbers differ from the wholesale values by species presented in the previous table in that fishing activities in a target fishery often result in the harvest of non-targeted species. Thus, the value presented here represents harvests of all species taken in a particular target fishery. A comparison of Table 10 and Table 11 shows that some targets have consistently higher wholesale values than the corresponding species value, while others have the opposite relationship and some vary from year to year. A clear example is the target for YSOL, which has a higher wholesale value for the target than the species in every year. Sablefish is an example in which the species value exceeds the target value in every year. BSAI rock sole and GOA SFLT are both examples in which the values vary, with some years having larger species values and some with larger target values. Comparing the percent of the yearly total for wholesale values by target with those of wholesale value by species it can be deduced that the percentage share of the YSOL target fishery is slightly larger than that of the species value. This is also true of the RSOL fishery, although it is not consistently so for the GOA shallow-water flatfish fishery.

Table 11. Wholesale Value of Production by Target Fishery for All Processors, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	SFLT	YSOL	Total
Year	**Wholesale Value of Production ($Millions)**										
1992	40.56	15.14	12.91	212.86	936.62	33.79	31.03	83.33	6.48	55.00	1,427.73
1993	49.68	29.44	5.51	134.29	564.75	29.64	33.94	91.13	8.33	48.89	995.59
1994	33.21	31.79	0.02	146.24	676.67	21.60	47.16	104.24	4.16	63.62	1,128.69
1995	46.54	37.85	0.14	215.19	850.14	31.91	32.08	104.55	5.65	67.05	1,391.09
1996	74.32	43.38	0.12	217.68	682.13	30.81	28.95	90.81	10.00	53.07	1,231.27
1997	38.45	31.67	0.40	221.49	687.12	24.71	27.85	84.72	5.20	77.75	1,199.37
1998	22.21	40.92	0.74	212.70	630.43	19.43	15.80	62.59	2.61	43.12	1,050.56
1999	25.92	39.62	1.03	294.19	716.50	25.14	16.47	66.01	0.90	29.29	1,215.09
2000	23.58	51.12	0.51	296.62	855.89	21.05	21.55	78.71	8.28	35.49	1,392.79
Year	**Wholesale Value of Production (Percent of Yearly Total)**										
1992	2.8	1.1	0.9	14.9	65.6	2.4	2.2	5.8	0.5	3.9	100.0
1993	5.0	3.0	0.6	13.5	56.7	3.0	3.4	9.2	0.8	4.9	100.0
1994	2.9	2.8	0.0	13.0	60.0	1.9	4.2	9.2	0.4	5.6	100.0
1995	3.3	2.7	0.0	15.5	61.1	2.3	2.3	7.5	0.4	4.8	100.0
1996	6.0	3.5	0.0	17.7	55.4	2.5	2.4	7.4	0.8	4.3	100.0
1997	3.2	2.6	0.0	18.5	57.3	2.1	2.3	7.1	0.4	6.5	100.0
1998	2.1	3.9	0.1	20.2	60.0	1.8	1.5	6.0	0.2	4.1	100.0
1999	2.1	3.3	0.1	24.2	59.0	2.1	1.4	5.4	0.1	2.4	100.0
2000	1.7	3.7	0.0	21.3	61.5	1.5	1.5	5.7	0.6	2.5	100.0

Source: NPFMC Sector Profile Database, 2001.

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and “other flatfish”.

Table 12 provides data for the catch of BSAI rock sole in BSAI target fisheries for all processors from 1992-2000. The total catch of RSOL peaked in 1997 at 67,810 metric tons but fell to less than half that value in 1998 when 33,660 metric tons were caught. By 2000, total catch had increased to 49,670 metric tons. The target fishery for RSOL is generally the largest single contributor to the total catch of RSOL. However, this contribution is not always a majority share. In recent years, significant catches of RSOL also occurred in the target fisheries for YSOL, PCOD, and OFLT. These data suggests that the imposition of IR/IU rules for BSAI rock sole will likely affect the target fishery for RSOL and could also affect the target fisheries for YSOL, PCOD and OFLT. The data also suggest that participants in the target fisheries for ROCK and SABL will not likely be affected by IR/IU rules because these target fisheries have recorded less than 10 metric tons of catch of RSOL in 2000 and in most years from 1992-2000.

Table 12. Catch of Bering Sea Rock Sole in BSAI Target Fisheries by All Processors, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	YSOL	Total
Year	**Metric Tons (Thousands)**									
1992	0.04	1.97	0.02	3.87	7.24	0.06	24.87	0.00	14.65	52.71
1993	0.10	2.44	0.08	5.69	8.71	0.06	39.86	0.00	7.30	64.25
1994	0.06	0.47	0.00	7.70	3.12	0.02	40.11	0.00	8.10	59.58
1995	0.14	2.04	0.01	13.91	2.19	0.02	29.24	0.00	7.49	55.03
1996	0.14	3.04	0.01	10.40	2.04	0.01	18.38	0.00	12.90	46.93
1997	0.05	2.24	0.00	14.81	1.53	0.01	32.48	0.00	16.69	67.81
1998	0.06	3.88	0.04	5.97	0.78	0.01	13.09	0.00	9.83	33.66
1999	0.07	2.74	0.05	10.35	1.06	0.01	16.05	0.00	10.77	41.09
2000	0.02	2.41	0.00	8.16	2.69	0.00	29.04	0.00	7.35	49.67
Year	**Percent of Total Catch**									
1992	0.1	3.7	0.0	7.3	13.7	0.1	47.2	0.0	27.8	100.0
1993	0.2	3.8	0.1	8.9	13.6	0.1	62.0	0.0	11.4	100.0
1994	0.1	0.8	0.0	12.9	5.2	0.0	67.3	0.0	13.6	100.0
1995	0.3	3.7	0.0	25.3	4.0	0.0	53.1	0.0	13.6	100.0
1996	0.3	6.5	0.0	22.2	4.4	0.0	39.2	0.0	27.5	100.0
1997	0.1	3.3	0.0	21.8	2.3	0.0	47.9	0.0	24.6	100.0
1998	0.2	11.5	0.1	17.7	2.3	0.0	38.9	0.0	29.2	100.0
1999	0.2	6.7	0.1	25.2	2.6	0.0	39.1	0.0	26.2	100.0
2000	0.0	4.8	0.0	16.4	5.4	0.0	58.5	0.0	14.8	100.0

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Table 13 shows the discards of BSAI rock sole by all processors from 1992 to 2000. This table and all the discard tables that follow are composed of three sections; the first section shows the amount of discards by target fishery; the second section shows the percent of discards by target fishery; and the third section shows discards as a percent of IR/IU flatfish catch (i.e., discard rate) by target fishery. Thus, in the lower section the total column corresponds with the percent of the total catch of the species of concern that is discarded. This number would not equal 100 percent unless all of the catch is discarded.

Total discards of RSOL have ranged from as high as 41,660 metric tons (1993) to as low as 21,000 (1998) and were 27,330 metric tons in 2000. Most of these discards occur in the target fisheries for RSOL, YSOL, PCOD and PLCK, and some discards occur in the OFLT target fishery.

Data on discards as a percent of BSAI rock sole catch shows that the highest rates of discard occur in the non-IR/IU flatfish target fisheries. However, it is important to compare the rates of discard as a percent of catch with the percent of BSAI rock sole catch for the target fishery. For example, the discards as a percent of RSOL catch in the other (OTHR) target fishery have been at or near 100 percent

in several years. However, the percent of RSOL catch data for the other (OTHR) target fishery shows that it has had no more than a 0.2 percent share in the total discards of the species. Thus, the impact of potential changes in IR/IU retention rules for BSAI rock sole would not likely have a large impact on participants in the other (OTHR) target fishery. This also appears to be true for target fisheries for AMCK, ROCK and SABL. The shallow-water flatfish complex is a GOA complex, so it has no part in the discards of RSOL. The target fisheries that have the largest shares of discards of RSOL are likely to be the most affected by IR/IU flatfish retention rules. These include target fisheries for RSOL, YSOL and PCOD and, possibly, PLCK and OFLT.

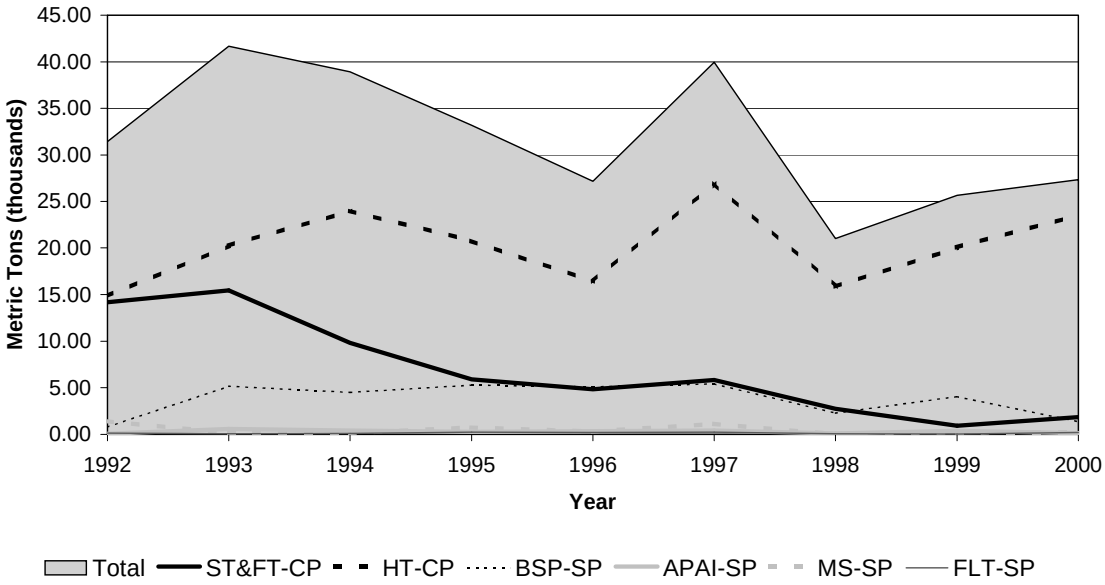
Table 13. Discards of Bering Sea Rock Sole in BSAI Target Fisheries by All Processors, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	YSOL	Total
Year	**Metric Tons (Thousands)**									
1992	0.03	0.63	0.02	2.64	5.64	0.04	12.17	0.00	10.24	31.41
1993	0.09	1.06	0.07	5.13	7.47	0.06	23.28	0.00	4.49	41.66
1994	0.05	0.33	0.00	7.19	2.53	0.02	23.28	0.00	5.52	38.92
1995	0.11	1.32	0.01	11.54	1.72	0.02	13.54	0.00	4.93	33.18
1996	0.13	1.84	0.01	8.55	1.57	0.01	6.94	0.00	8.11	27.16
1997	0.04	1.51	0.00	12.25	1.45	0.00	13.71	0.00	11.00	39.97
1998	0.03	2.90	0.04	4.98	0.44	0.01	5.42	0.00	7.18	21.00
1999	0.06	2.03	0.03	8.29	0.83	0.00	7.41	0.00	6.99	25.65
2000	0.02	1.43	0.00	5.63	1.95	0.00	14.49	0.00	3.82	27.33
Year	**Percent of Bering Sea Rock Sole Discards**									
1992	0.1	2.0	0.1	8.4	18.0	0.1	38.7	0.0	32.6	100.0
1993	0.2	2.5	0.2	12.3	17.9	0.1	55.9	0.0	10.8	100.0
1994	0.1	0.9	0.0	18.5	6.5	0.0	59.8	0.0	14.2	100.0
1995	0.3	4.0	0.0	34.8	5.2	0.1	40.8	0.0	14.8	100.0
1996	0.5	6.8	0.0	31.5	5.8	0.0	25.5	0.0	29.8	100.0
1997	0.1	3.8	0.0	30.6	3.6	0.0	34.3	0.0	27.5	100.0
1998	0.2	13.8	0.2	23.7	2.1	0.0	25.8	0.0	34.2	100.0
1999	0.2	7.9	0.1	32.3	3.2	0.0	28.9	0.0	27.3	100.0
2000	0.1	5.2	0.0	20.6	7.1	0.0	53.0	0.0	14.0	100.0
Year	**Discards as a Percent of Bering Sea Rock Sole Catch**									
1992	74.0	32.0	99.9	68.3	77.9	65.3	48.9	0.0	69.9	59.6
1993	90.1	43.2	99.5	90.1	85.7	93.3	58.4	100.0	61.5	64.8
1994	83.5	70.3	100.0	93.4	81.1	92.1	58.1	0.0	68.2	65.3
1995	81.1	64.5	100.0	83.0	78.8	81.9	46.3	100.0	65.8	60.3
1996	92.2	60.5	100.0	82.2	77.0	64.5	37.8	81.5	62.8	57.9
1997	82.2	67.7	99.7	82.7	94.8	42.2	42.2	0.0	65.9	58.9
1998	56.0	74.7	88.0	83.5	57.0	97.7	41.4	0.0	73.1	62.4
1999	89.0	74.2	53.2	80.1	78.5	39.7	46.2	0.0	64.9	62.4
2000	77.0	59.3	99.4	69.1	72.4	8.1	49.9	99.2	52.0	55.0

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Figure 1 provides a graphical depiction of discards of RSOL by processing sectors across all target fisheries. Note that the figure only includes those processing sectors that had significant discard amounts. The graph clearly shows that head and gut trawl catcher processors (HT-CP) discard the greatest proportion of total discards of RSOL. Fillet trawl catcher processors and Bering Sea pollock shore plants have historically discarded the next largest proportion with the other sectors having relatively small discard amounts.

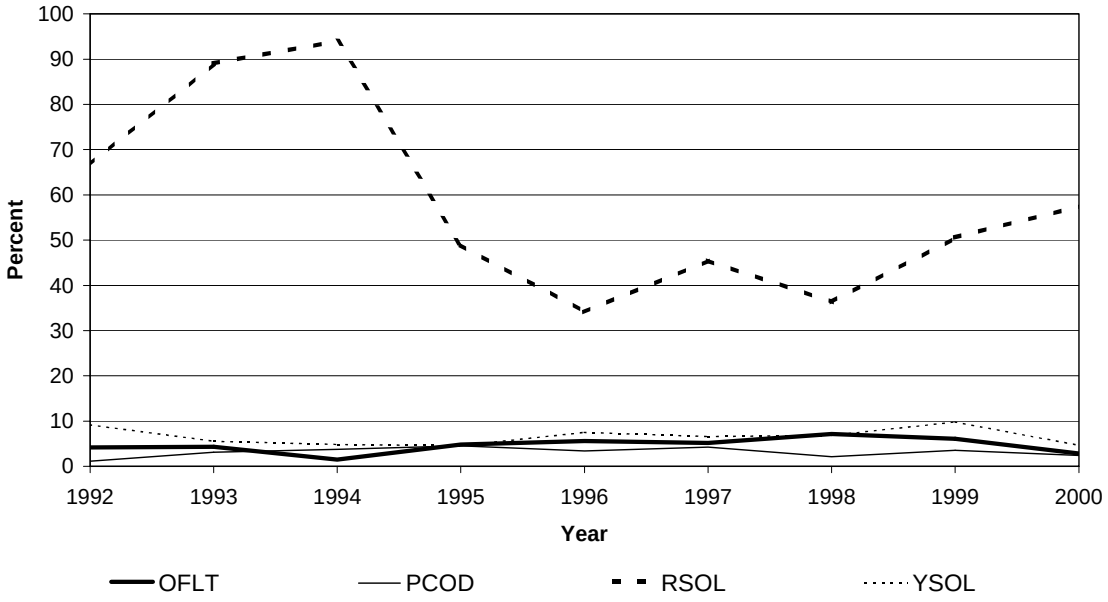
Figure 1. Discards of Bering Sea Rock Sole by Processing Sectors, 1992-2000



Source: NPFMC Sector Profile Database, 2001

Figure 2 provides a graphical depiction of RSOL discards as a percent of total retained catch by target fishery. The graph only includes those target fisheries where discards of RSOL were at least five percent of total retained catch. The figure shows that in the fisheries where RSOL is caught incidentally, discards of RSOL have historically been less than ten percent of total retained catch and were around five percent in 2000. Those fisheries included OFLT, PCOD and YSOL. In contrast, the RSOL target fishery has had historical discards that have been above 30 percent of total retained catch in all years and were around 60 percent in 2000. Note that the data shown here are for all processors. Individual sectors may have higher or lower rates of discards.

Figure 2. Discards of Bering Sea Rock Sole as a Percent of Groundfish Retained Catch by All Processors, 1992-2000



Source: NPFMC Sector Profile Database, 2001

Table 14 provides data on the catch of YSOL by target fishery for all processors from 1992-2000. Total catch during the period has varied considerably. In 1997, harvests peaked at 182,810 metric tons but declined significantly over the next two years and were 84,070 metric tons in 2000. This decline in total harvest since the mid-1990s is generally consistent with declines in processor participation in the YSOL target fishery. Percent of YSOL catch in each target shows that nearly all YSOL is harvested in the target fishery for YSOL. Relatively small amounts are also harvested in the target fisheries for OFLT, RSOL, PCOD and PLCK. These data suggest that IR/IU rules are likely to have the greatest effect on participants in the YSOL target fishery. However, some effects may also accrue to participants in the target fisheries for OFLT, RSOL, PCOD and PLCK. The data also suggest that participants in the target fisheries for AMCK, OTHR, ROCK and SABL will not likely be affected by IR/IU rules because these target fisheries have recorded less than ten metric tons of catch of YSOL in 2000 and in most years from 1992-2000. The extent to which the rules will affect the various target fisheries will depend on the rate of discard of YSOL in each target fishery.

Table 14. Catch of Bering Sea Yellowfin Sole in BSAI Target Fisheries by All Processors, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	YSOL	Total
Year	**Metric Tons (Thousands)**									
1992	0.00	3.07	0.16	0.38	0.89	0.00	4.07	0.00	136.80	145.37
1993	0.00	5.67	0.00	0.83	1.10	0.00	6.28	0.00	91.93	105.81
1994	0.00	3.67	0.01	3.26	1.21	0.05	5.62	0.00	126.16	139.98
1995	0.00	7.85	0.01	0.84	0.68	0.00	6.88	0.00	108.49	124.75
1996	0.00	6.75	0.04	2.23	1.80	0.00	6.03	0.00	112.82	129.66
1997	0.00	3.83	0.01	1.11	0.61	0.00	7.60	0.00	169.66	182.81
1998	0.00	6.74	0.24	1.15	1.76	0.01	1.36	0.00	90.06	101.32
1999	0.02	3.69	0.18	0.68	0.35	0.00	1.42	0.00	62.94	69.28
2000	0.00	6.56	0.00	1.59	1.47	0.00	2.98	0.00	71.48	84.07
Year	**Percent of Total Bering Sea Yellowfin Sole Catch**									
1992	0.0	2.1	0.1	0.3	0.6	0.0	2.8	0.0	94.1	100.0
1993	0.0	5.4	0.0	0.8	1.0	0.0	5.9	0.0	86.9	100.0
1994	0.0	2.6	0.0	2.3	0.9	0.0	4.0	0.0	90.1	100.0
1995	0.0	6.3	0.0	0.7	0.5	0.0	5.5	0.0	87.0	100.0
1996	0.0	5.2	0.0	1.7	1.4	0.0	4.7	0.0	87.0	100.0
1997	0.0	2.1	0.0	0.6	0.3	0.0	4.2	0.0	92.8	100.0
1998	0.0	6.7	0.2	1.1	1.7	0.0	1.3	0.0	88.9	100.0
1999	0.0	5.3	0.3	1.0	0.5	0.0	2.1	0.0	90.9	100.0
2000	0.0	7.8	0.0	1.9	1.7	0.0	3.5	0.0	85.0	100.0

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Table 15 shows the historic discards of YSOL in target fisheries of all processors from 1992 to 2000. Total discards of YSOL have ranged from as high as 42,830 metric tons (1992) to as low as 12,470 (1999) and were 14,100 metric tons in 2000. Most of these discards occur in the YSOL target fishery. However, the discard rate in the YSOL target fishery is relatively low when compared to the other target fisheries and was at its lowest in 2000 at 13.4 percent. Lesser amounts of discards also occur in the RSOL, OFLT, PCOD and PLCK target fisheries. Discard rates for the RSOL and OFLT target fisheries are moderate relative to that of the YSOL target fishery, but some participants in these target fisheries may be affected by IR/IU flatfish rules. The target fisheries for AMCK, OTHR, ROCK and SABL have little or no share in total discards of YSOL. However, discard rates in some of these targets tend to be high, if not 100 percent, in years when they have measurable (10 metric tons or greater) discard amounts. It is possible that some participants in these target fisheries would be affected by IR/IU rules because of required use of hold space for YSOL that would otherwise be discarded. The extent of these effects will depend on what proportion of hold space must be used to meet the IR/IU rules.

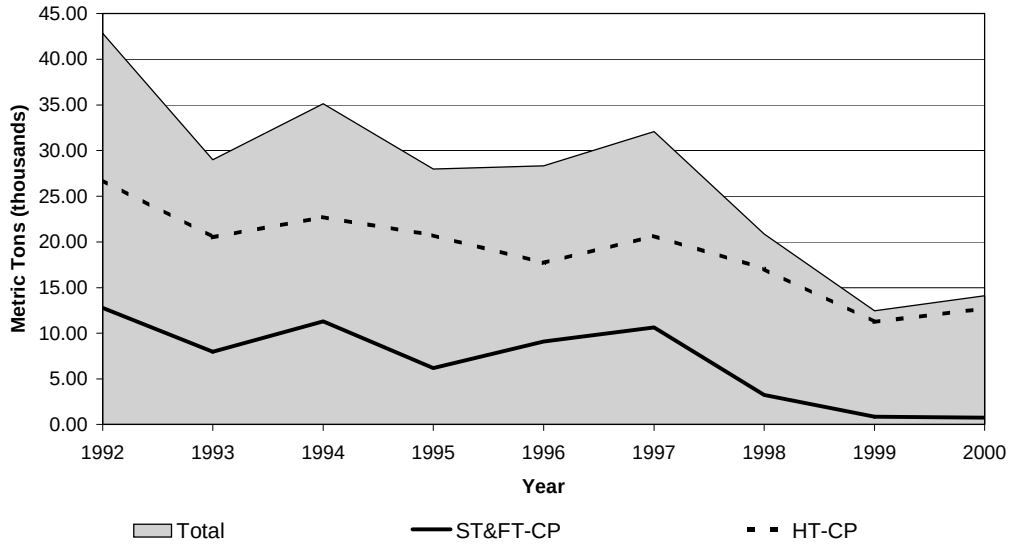
Table 15. Discards of Bering Sea Yellowfin Sole in BSAI Target Fisheries by All Processors, 1992-2000

	AMCK	OFLT	OTHR	PCOD	PLCK	ROCK	RSOL	SABL	YSOL	Total
Year	**Metric Tons (Thousands)**									
1992	0.00	0.59	0.16	0.37	0.73	0.00	2.73	0.00	38.24	42.83
1993	0.00	2.30	0.00	0.83	0.97	0.00	3.80	0.00	21.12	29.01
1994	0.00	1.12	0.01	1.58	0.83	0.03	3.65	0.00	27.91	35.13
1995	0.00	3.50	0.01	0.48	0.58	0.00	2.00	0.00	21.41	27.98
1996	0.00	2.76	0.04	1.74	1.49	0.00	2.35	0.00	19.96	28.34
1997	0.00	1.02	0.01	0.93	0.61	0.00	2.56	0.00	26.94	32.07
1998	0.00	3.35	0.08	0.83	1.28	0.01	1.00	0.00	14.31	20.86
1999	0.00	1.85	0.04	0.60	0.13	0.00	0.86	0.00	8.99	12.47
2000	0.00	1.67	0.00	1.31	0.83	0.00	0.69	0.00	9.60	14.10
Year	**Percent of Bering Sea Yellowfin Sole Discards**									
1992	0.0	1.4	0.4	0.9	1.7	0.0	6.4	0.0	89.3	100.0
1993	0.0	7.9	0.0	2.8	3.3	0.0	13.1	0.0	72.8	100.0
1994	0.0	3.2	0.0	4.5	2.3	0.1	10.4	0.0	79.5	100.0
1995	0.0	12.5	0.0	1.7	2.1	0.0	7.2	0.0	76.5	100.0
1996	0.0	9.8	0.1	6.1	5.3	0.0	8.3	0.0	70.4	100.0
1997	0.0	3.2	0.0	2.9	1.9	0.0	8.0	0.0	84.0	100.0
1998	0.0	16.1	0.4	4.0	6.1	0.0	4.8	0.0	68.6	100.0
1999	0.0	14.8	0.3	4.8	1.0	0.0	6.9	0.0	72.1	100.0
2000	0.0	11.9	0.0	9.3	5.9	0.0	4.9	0.0	68.1	100.0
Year	**Discards as a Percent of Bering Sea Yellowfin Sole Catch**									
1992	20.0	19.2	100.0	99.1	82.2	100.0	67.2	0.0	28.0	29.5
1993	0.0	40.6	100.0	99.5	87.6	100.0	60.5	0.0	23.0	27.4
1994	100.0	30.6	100.0	48.5	68.4	52.1	64.9	100.0	22.1	25.1
1995	47.8	44.5	100.0	57.4	85.4	0.0	29.1	0.0	19.7	22.4
1996	100.0	41.0	100.0	77.8	82.9	100.0	38.9	0.0	17.7	21.9
1997	100.0	26.8	99.4	83.4	99.9	0.0	33.7	0.0	15.9	17.5
1998	100.0	49.7	34.3	72.3	72.8	100.0	73.6	0.0	15.9	20.6
1999	28.5	50.0	20.4	88.3	36.4	0.0	60.2	0.0	14.3	18.0
2000	46.2	25.5	98.6	82.4	56.6	100.0	23.1	0.0	13.4	16.8

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Figure 3 provides a graphical depiction of discards of YSOL by processing sectors across target fisheries. Head and gut trawl catcher processors have historically discarded the largest share of total discards and their share has been increasing in recent years. Overall, a general downward trend in total discards of YSOL is evident for all sectors.

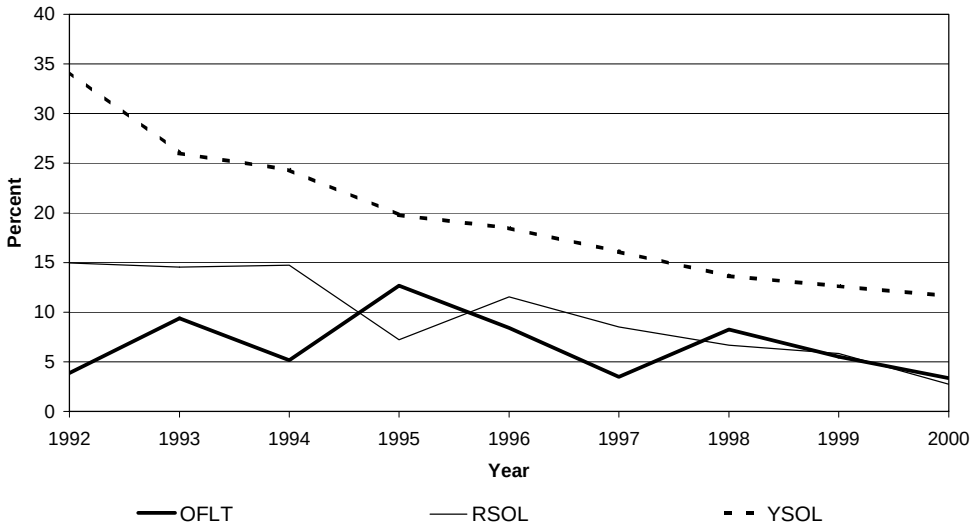
Figure 3. Discards of Bering Sea Yellowfin Sole by Processing Sectors, 1992-2000



Source: NPFMC Sector Profile Database, 2001

Figure 4 shows discards of YSOL as a percent of total retained catch for all processing sectors in target fisheries. Only the OFLT, RSOL and YSOL target fisheries are shown here because they are the only target fisheries where discards as a percent of total retained catch have consistently been five percent or more. Of note is that discards as a percent of total retained catch have been trending downward in recent years for all three target fisheries. In the OFLT and RSOL fisheries, discards as a percent of total catch have been below five percent in the last several years. In the YSOL target fishery, discards as a percent of total retained catch have fallen to just over ten percent in 2000.

Figure 4. Discards of BSAI Yellowfin Sole as a Percent of Retained Catch by All Processors, 1992-2000



Source: NPFMC Sector Profile Database, 2001

Table 16 provides data on the catch of SFLT by GOA target fishery and for all processors from 1992-2000. The catch of SFLT has fluctuated considerably during this period. The largest catch was recorded in 1993 at 9,650 metric tons. Total catch of this species complex declined by more than half in 1994 but increased to 9,370 metric tons in 1996. From 1996 to 1999, the catch declined to a period low of 2,540 metric tons. This low corresponds with the period low in participation in the SFLT target fishery. In 2000, the 1999 low value more than doubled to 6,930 metric tons of total catch.

The percent of catch data show that the target fishery for SFLT contributes the largest share of total catch of SFLT. However, that contribution is not always a majority share. In some years, significant catch has also occurred in the target fisheries for PCOD, OFLT, PLCK and ROCK. Thus, the effects of IR/IU rules for GOA shallow-water flatfish may accrue to some participants in these target fisheries. Small but measurable harvests of SFLT also occur in some years in the OTHR and SABL target fisheries.

Table 16. Catch of Gulf of Alaska Shallow-water Flatfish in GOA Target Fisheries by All Processors, 1992-2000

	OFLT	OTHR	PCOD	PLCK	ROCK	SABL	SFLT	Total
Year	**Metric Tons (Thousands)**							
1992	0.49	0.11	3.27	0.44	0.04	0.00	4.01	8.37
1993	0.49	0.07	1.19	1.63	0.02	0.00	6.26	9.65
1994	0.56	0.00	0.84	0.17	0.03	0.00	2.18	3.80
1995	0.53	0.00	1.79	0.04	0.32	0.01	2.74	5.43
1996	0.69	0.00	1.41	0.17	0.37	0.01	6.69	9.37
1997	0.71	0.05	3.00	0.19	0.11	0.00	3.69	7.75
1998	0.25	0.01	1.65	0.03	0.11	0.00	1.50	3.56
1999	0.09	0.05	1.39	0.04	0.07	0.02	0.87	2.54
2000	0.75	0.00	0.99	0.08	0.37	0.01	4.73	6.93
Year	**Percent of Total Gulf of Alaska Shallow-water Flatfish Catch**							
1992	5.8	1.4	39.1	5.3	0.4	0.0	47.9	100.0
1993	5.0	0.7	12.3	16.9	0.2	0.0	64.9	100.0
1994	14.7	0.0	22.0	4.5	0.8	0.0	57.3	100.0
1995	9.8	0.0	33.0	0.8	5.9	0.2	50.4	100.0
1996	7.4	0.0	15.0	1.9	3.9	0.1	71.4	100.0
1997	9.2	0.6	38.7	2.5	1.4	0.0	47.6	100.0
1998	7.2	0.3	46.4	0.9	3.1	0.1	42.1	100.0
1999	3.4	2.2	54.8	1.4	2.9	0.9	34.4	100.0
2000	10.9	0.0	14.3	1.2	5.3	0.1	68.3	100.0

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Table 17 shows the historic discards of SFLT in target fisheries of all processors from 1992 to 2000. Total discards of SFLT have ranged from as high as 3,400 metric tons (1993) to as low as 550 (1999) and were 780 metric tons in 2000. Most of these discards occur in the target fisheries for SFLT, PCOD, OFLT, PLCK and ROCK. The target fisheries for OTHR and SABL have little or no share in total discards of SFLT.

The data on discards as a percent of SFLT catch show that the highest rates of discard generally occur in the PCOD, PLCK, SABL and ROCK fisheries. Comparing the rates of discard as a percent of catch with the percent of catch for the target fishery shows that IR/IU retention rules for SFLT would not likely have a large impact on participants in the OTHR target fishery. This is also true for target fisheries for AMCK and SABL. The target fisheries that have the largest shares of discards of SFLT are likely to be most affected by IR/IU flatfish retention rules. These include target fisheries for SFLT, PCOD, OFLT, PLCK and ROCK.

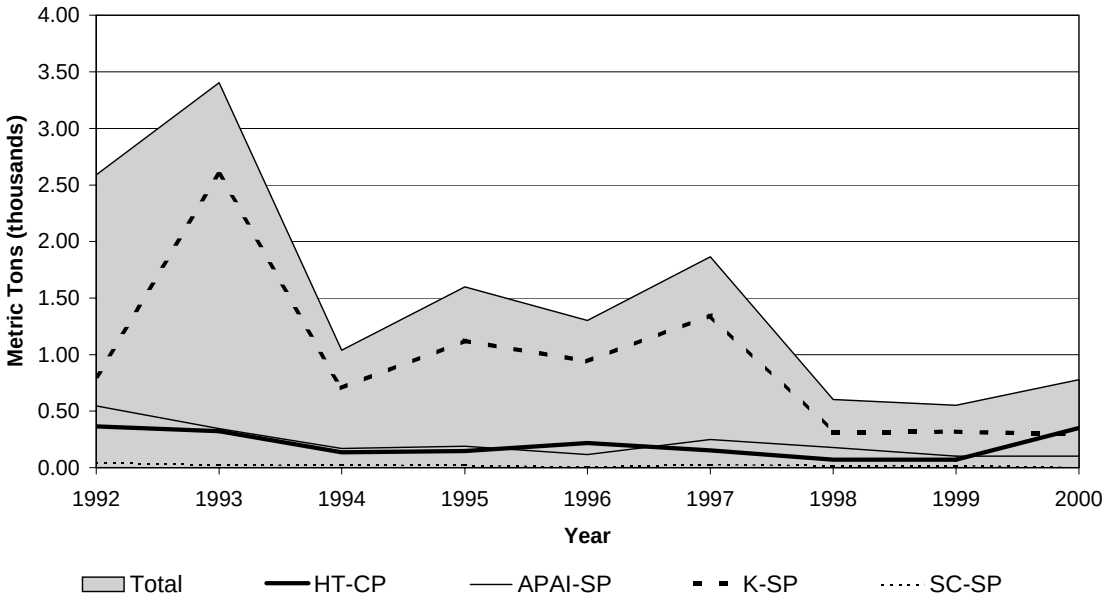
Table 17. Discards of Gulf of Alaska Shallow-water Flatfish in GOA Target Fisheries by All Processors, 1992-2000

	OFLT	OTHR	PCOD	PLCK	ROCK	SABL	SFLT	Total
Year	**Metric Tons (Thousands)**							
1992	0.09	0.04	1.81	0.21	0.02	0.00	0.42	2.59
1993	0.12	0.05	0.73	0.88	0.01	0.00	1.61	3.40
1994	0.15	0.00	0.44	0.04	0.02	0.00	0.37	1.04
1995	0.12	0.00	0.76	0.02	0.14	0.01	0.56	1.60
1996	0.14	0.00	0.30	0.06	0.07	0.00	0.72	1.30
1997	0.17	0.01	0.90	0.16	0.06	0.00	0.56	1.86
1998	0.04	0.00	0.45	0.01	0.01	0.00	0.10	0.60
1999	0.04	0.00	0.36	0.02	0.04	0.02	0.07	0.55
2000	0.11	0.00	0.48	0.01	0.04	0.01	0.14	0.78
Year	**Percent of Gulf of Alaska Shallow-water Flatfish Discards**							
1992	3.4	1.7	70.0	8.1	0.6	0.1	16.1	100.0
1993	3.5	1.4	21.4	26.0	0.3	0.1	47.2	100.0
1994	14.8	0.0	42.3	3.9	1.4	0.0	35.4	100.0
1995	7.3	0.0	47.5	1.0	8.7	0.7	34.8	100.0
1996	10.7	0.0	22.8	4.9	5.6	0.3	55.4	100.0
1997	9.4	0.6	48.1	8.4	3.1	0.2	30.2	100.0
1998	6.3	0.0	74.2	1.1	1.3	0.3	16.9	100.0
1999	7.5	0.1	64.6	3.3	7.3	4.2	13.0	100.0
2000	13.5	0.0	61.1	1.4	4.6	0.8	18.5	100.0
Year	**Discards as a Percent of Gulf of Alaska Shallow-water Flatfish Catch**							
1992	17.9	38.9	55.3	47.5	44.9	100.0	10.4	30.9
1993	24.8	68.7	61.4	54.4	65.0	100.0	25.7	35.3
1994	27.4	11.5	52.4	23.5	51.7	25.4	16.9	27.3
1995	22.0	0.0	42.4	36.7	43.4	100.0	20.4	29.4
1996	20.2	100.0	21.1	36.5	19.7	33.3	10.8	13.9
1997	24.5	22.0	29.9	82.4	53.8	100.0	15.3	24.1
1998	15.0	0.0	27.0	20.1	7.0	83.2	6.8	16.9
1999	47.7	0.7	25.6	50.2	55.9	98.6	8.2	21.8
2000	14.0	0.0	48.2	13.7	9.9	91.5	3.0	11.2

Note: OFLT is an aggregate of non-IR/IU flatfish fisheries, including fisheries for flathead sole, Greenland turbot, arrowtooth flounder, deepwater flatfish and "other flatfish".

Figure 5 provides a graphical depiction of discards of SFLT by processing sectors. Historically, Kodiak shore plants have had the largest share of total discards, however, their share has been decreasing since 1997 and the share for head and gut trawl catcher processors has increased since 1999. Of note is the scale of this graph as compared to those for RSOL and YSOL. Discards of SFLT have been less than 1,000 metric tons in the past several years as compared to RSOL discards of over 25,000 metric tons and YSOL discards nearing 15,000 metric tons.

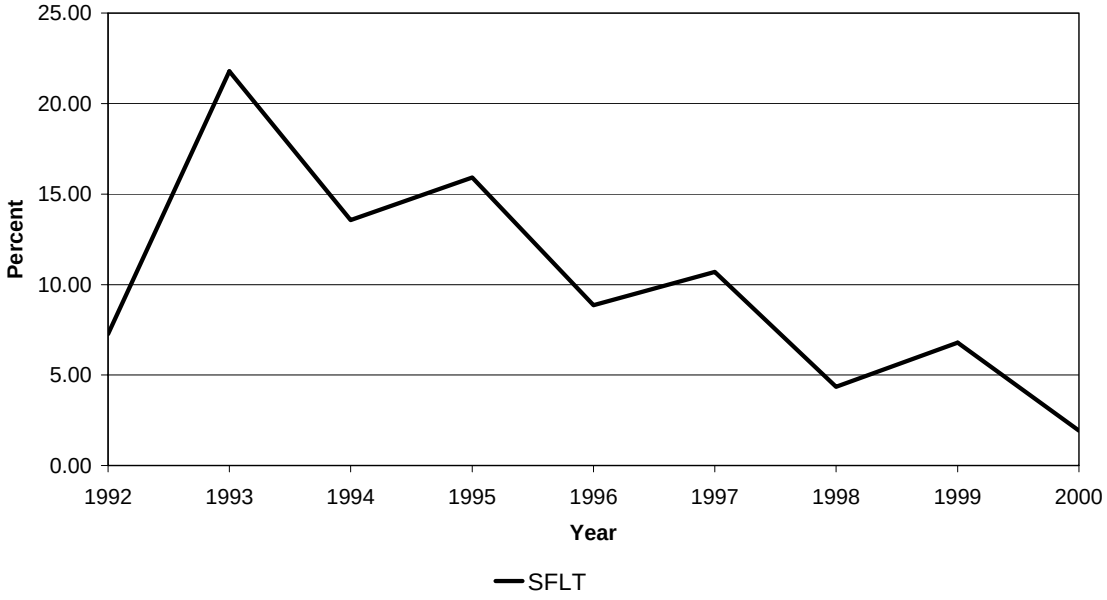
Figure 5. Discards of Gulf of Alaska Shallow-water Flatfish by Processing Sectors, 1992-2000



Source: NPFMC Sector Profile Database, 2001

Figure 6 shows discards of SFLT as a percent of total retained catch for all processors. Of note is that the only target fishery with significant discards as a percent of total retained catch has been the SFLT target fishery. As shown in the graph, discards as a percent of total retained catch have been trending downward and were less than 3 percent in 2000.

Figure 6. Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Groundfish Retained Catch by Processing Sectors, 1992-2000



Source: NPFMC Sector Profile Database, 2001

2.2.2 Description of Processing Sectors Potentially Affected by IR/IU Flatfish Rules

The above discussion of participation, wholesale value, and IR/IU flatfish catch and discards for all processors provides an overview of existing conditions relevant to the implementation of IR/IU flatfish rules in GOA and BSAI groundfish fisheries. The discussion pointed out that participation rates vary in the target fisheries and that IR/IU flatfish rules may affect both target fisheries for IR/IU flatfish and fisheries in which IR/IU flatfish are caught incidentally. The extent to which these effects will be felt will depend on the relative importance of each affected fishery to participants as well as the amount of IR/IU flatfish discarded in the fishery. To evaluate the potential magnitude of these effects, the following analysis will provide a comparison of catch and discards of IR/IU flatfish in the processing sectors listed in Table 8.

Table 18 provides data on the catch of RSOL by processing sector from 1992-2000. Three sectors have historically harvested the vast majority of RSOL. These are the surimi and fillet (ST&FT-CP) catcher processors, head and gut trawl catcher processors (HT-CP) and Bering Sea pollock shore plants (BSP-SP). Of these, head and gut trawl catcher processors accounted for more than 70 percent of all RSOL harvested each year since 1995.

Several other sectors have had small but measurable harvests of RSOL. These include longline catcher processors (L-CP), Alaska Peninsula-Aleutian Islands shore plants (APAI-SP), motherships (M-SP) and floating processors (FLT). Though their share of the total catch of RSOL tends to be small, some participants in these sectors may experience economic impacts from IR/IU flatfish rules.

Catch data for RSOL show that pot catcher processors (P-CP), Kodiak shore plants (K-SP), Southcentral shore plants (SC-SP) and Southeast shore plants (SE-SP) have had little measurable catch of BSAI rock sole over the years and have had none since 1997. Thus, participants in these four sectors are not likely to experience economic impacts from IR/IU rules for RSOL.

Table 18. Catch of Bering Sea Rock Sole by Processing Sector for All Target Fisheries, 1992-2000

	ST&FT-CP	HT-CP	P-CP	L-CP	BSP-SP	APAI-SP	K-SP	SC-SP	SE-SP	MS	FLT	Total
1992	21.16	28.22	0.00	0.03	0.94	0.05	0.00	0.01	0.00	1.89	0.41	52.71
1993	22.97	35.29	0.00	0.02	5.18	0.55	0.04	0.00	0.00	0.15	0.04	64.25
1994	15.43	38.69	0.00	0.03	4.66	0.40	0.01	0.00	0.00	0.23	0.14	59.58
1995	8.64	38.30	0.00	0.05	5.71	0.25	0.01	0.00	0.00	1.71	0.37	55.03
1996	7.37	33.39	0.00	0.06	5.17	0.33	0.01	0.00	0.00	0.28	0.32	46.93
1997	9.24	50.29	0.00	0.04	6.49	0.42	0.00	0.00	0.00	1.10	0.23	67.81
1998	4.60	26.58	0.00	0.04	2.31	0.08	0.00	0.00	0.00	0.01	0.03	33.66
1999	1.35	34.99	0.00	0.06	4.12	0.37	0.00	0.00	0.00	0.18	0.01	41.09
2000	3.30	44.00	0.00	0.03	1.71	0.16	0.00	0.00	0.00	0.27	0.20	49.67
Year	**Percent of Bering Sea Rock Sole Catch**											
1992	40.15	53.54	0.0	0.05	1.78	0.10	0.00	0.02	0.00	3.58	0.78	100.0
1993	35.75	54.93	0.0	0.03	8.06	0.86	0.07	0.00	0.00	0.23	0.07	100.0
1994	25.89	64.95	0.0	0.04	7.82	0.67	0.01	0.00	0.00	0.38	0.23	100.0
1995	15.70	69.60	0.0	0.08	10.37	0.45	0.01	0.00	0.00	3.10	0.68	100.0
1996	15.71	71.15	0.0	0.13	11.03	0.70	0.01	0.00	0.00	0.60	0.67	100.0
1997	13.63	74.15	0.0	0.06	9.57	0.61	0.00	0.00	0.00	1.63	0.34	100.0
1998	13.68	78.97	0.0	0.12	6.87	0.25	0.00	0.00	0.00	0.02	0.09	100.0
1999	3.30	85.14	0.0	0.14	10.03	0.91	0.00	0.00	0.00	0.45	0.03	100.0
2000	6.64	88.60	0.0	0.07	3.44	0.31	0.00	0.00	0.00	0.54	0.39	100.0

Source: NPFMC Sector Profile Database, 2001.

Table 19 presents RSOL discard data for processing sectors from 1992-2000. Head and gut trawl catcher processors have consistently accounted for the largest share of RSOL discards and this share has been increasing over the past several years. In 2000, discards of RSOL by head and gut trawl catcher processors represented 86.2 percent of the total RSOL discards. Surimi and fillet trawl catcher processors accounted for 6.7 percent of the total, while Bering Sea pollock shore plants accounted for 4.9 percent.

In the years from 1992-2000, the head and gut trawl catcher processors have had RSOL discard rates greater than 50 percent in all but one year. Similar discard rates are evident for the surimi and fillet trawl catcher processor sector. In 1999, for example, ST&FT-CPs discarded 67.04 percent of their catch of RSOL. Some sectors, primarily those that do not target RSOL, often discard all or nearly all of the RSOL they catch. This appears to be true of pot and longline catcher processors. There are also high RSOL discard rates for Bering Sea pollock and Alaska Peninsula and Aleutian Islands shore plants, floating processors and motherships.

Table 19 shows that several sectors have had no measurable discards of RSOL in recent years. These include Kodiak shore plants, Southcentral shore plants and Southeast shore plants. These shore plants generally do not receive BSAI rock sole because of their location in the GOA. As a result, these sectors will be eliminated from further discussion of the implications of IR/IU rules for RSOL.

Table 19. Discards of Bering Sea Rock Sole by Processing Sector for All Target Fisheries, 1992-2000

	ST&FT-CP	HT-CP	P-CP	L-CP	BSP-SP	APAI-SP	K-SP	SC-SP	SE-SP	MS	FLT	Total
Year						**Metric Tons (Thousands)**						
1992	14.20	14.83	0.00	0.02	0.76	0.05	0.00	0.01	0.00	1.40	0.13	31.41
1993	15.45	20.26	0.00	0.02	5.16	0.55	0.04	0.00	0.00	0.14	0.04	41.66
1994	9.80	23.99	0.00	0.02	4.48	0.40	0.01	0.00	0.00	0.13	0.09	38.92
1995	5.90	20.77	0.00	0.04	5.28	0.25	0.01	0.00	0.00	0.72	0.22	33.18
1996	4.84	16.41	0.00	0.06	5.07	0.33	0.00	0.00	0.00	0.28	0.17	27.16
1997	5.81	26.97	0.00	0.04	5.41	0.41	0.00	0.00	0.00	1.10	0.23	39.97
1998	2.73	15.85	0.00	0.04	2.27	0.08	0.00	0.00	0.00	0.01	0.03	21.00
1999	0.91	20.06	0.00	0.06	4.05	0.37	0.00	0.00	0.00	0.18	0.01	25.65
2000	1.83	23.56	0.00	0.03	1.34	0.14	0.00	0.00	0.00	0.23	0.20	27.33
Year						**Percent of Bering Sea Rock Sole Discards**						
1992	45.21	47.21	0.0	0.07	2.42	0.17	0.00	0.04	0.00	4.45	0.40	100.0
1993	37.08	48.64	0.0	0.04	12.38	1.33	0.09	0.00	0.00	0.34	0.10	100.0
1994	25.18	61.63	0.0	0.06	11.51	1.03	0.02	0.00	0.00	0.34	0.24	100.0
1995	17.78	62.58	0.0	0.12	15.92	0.74	0.02	0.00	0.00	2.18	0.65	100.0
1996	17.81	60.41	0.0	0.21	18.68	1.21	0.01	0.00	0.00	1.04	0.62	100.0
1997	14.54	67.47	0.0	0.10	13.53	1.03	0.00	0.00	0.00	2.76	0.58	100.0
1998	12.98	75.47	0.0	0.18	10.80	0.40	0.00	0.00	0.00	0.03	0.15	100.0
1999	3.54	78.22	0.0	0.23	15.78	1.45	0.00	0.00	0.00	0.72	0.05	100.0
2000	6.70	86.19	0.0	0.12	4.92	0.50	0.00	0.00	0.00	0.84	0.72	100.0
Year						**Discards as a Percent of Bering Sea Rock Sole Catch**						
1992	67.11	52.55	100.00	85.53	81.29	100.00	0.00	100.00	0.00	74.16	31.07	59.60
1993	67.25	57.41	0.00	98.05	99.55	100.00	83.61	0.00	80.00	97.47	100.00	64.84
1994	63.53	61.99	0.00	89.92	96.15	100.00	100.00	0.00	0.00	57.95	68.32	65.33
1995	68.30	54.21	100.00	85.75	92.56	100.00	78.57	0.00	0.00	42.38	58.16	60.30
1996	65.61	49.14	100.00	96.35	98.06	99.70	59.41	0.00	0.00	99.96	53.38	57.87
1997	62.86	53.63	100.00	97.29	83.28	98.52	0.00	0.00	0.00	100.00	100.00	58.94
1998	59.19	59.63	100.00	97.42	98.03	99.98	0.00	0.00	0.00	99.18	100.00	62.40
1999	67.04	57.35	100.00	97.64	98.27	100.00	0.00	0.00	0.00	99.99	100.00	62.42
2000	55.54	53.54	100.00	99.79	78.60	88.00	0.00	0.00	0.00	86.37	99.98	55.04

Source: NPFMC Sector Profile Database, 2001.

Table 20 provides data on the catch of YSOL in all target fisheries by processing sector from 1992-2000. As in the case of RSOL, three sectors have historically harvested the vast majority of YSOL. These include the ST&FT-CPs, HT-CPs and BSP-SPs. Of these, the head and gut trawl catcher processors accounted for between 55 percent and 87 percent of all YSOL harvested each year from 1992-2000.

Several sectors have consistently had annual harvests of YSOL that are zero or near zero. These include pot catcher processors, longline catcher processors and shore plants in the Alaska Peninsula and Aleutian Islands, Kodiak, Southeast and Southcentral Regions. Since 1996, motherships have accounted for less than 0.2 percent of the total catch of YSOL. Similarly, floating processors have accounted for less than one-tenth of 1 percent of the total catch of YSOL since 1996.

Table 20. Catch of Bering Sea Yellowfin Sole by Processing Sector for All Target Fisheries, 1992-2000

	ST&FT-CP	HT-CP	P-CP	L-CP	BSP-SP	APAI-SP	K-SP	SC-SP	SE-SP	MS	FLT	Total
Year	**Metric Tons (Thousands)**											
1992	50.82	82.16	0.00	0.06	3.63	0.00	0.01	0.00	0.00	7.34	1.36	145.37
1993	36.35	68.68	0.00	0.00	0.39	0.05	0.30	0.00	0.00	0.04	0.00	105.81
1994	45.34	84.27	0.00	0.15	8.30	0.04	0.00	0.00	0.00	0.27	1.61	139.98
1995	39.14	70.38	0.01	0.06	7.55	0.02	0.00	0.00	0.00	2.89	4.70	124.75
1996	50.70	71.39	0.07	0.19	5.71	0.13	0.00	0.00	0.00	0.01	1.47	129.66
1997	43.41	124.19	0.03	0.22	14.88	0.03	0.00	0.00	0.00	0.03	0.02	182.81
1998	21.82	78.81	0.08	0.27	0.31	0.01	0.00	0.00	0.00	0.02	0.01	101.32
1999	11.74	55.93	0.03	0.19	1.33	0.02	0.00	0.00	0.00	0.03	0.00	69.28
2000	8.65	72.96	0.06	0.30	1.96	0.01	0.00	0.00	0.00	0.12	0.01	84.07
Year	**Percent of Bering Sea Yellowfin Sole Catch**											
1992	34.96	56.51	0.0	0.04	2.50	0.00	0.01	0.00	0.00	5.05	0.93	100.0
1993	34.35	64.91	0.0	0.00	0.37	0.05	0.28	0.00	0.00	0.03	0.00	100.0
1994	32.39	60.20	0.0	0.11	5.93	0.03	0.00	0.00	0.00	0.19	1.15	100.0
1995	31.38	56.41	0.0	0.05	6.05	0.02	0.00	0.00	0.00	2.31	3.77	100.0
1996	39.10	55.06	0.1	0.14	4.40	0.10	0.00	0.00	0.00	0.01	1.14	100.0
1997	23.75	67.93	0.0	0.12	8.14	0.02	0.00	0.00	0.00	0.02	0.01	100.0
1998	21.53	77.78	0.1	0.26	0.31	0.01	0.00	0.00	0.00	0.02	0.01	100.0
1999	16.95	80.73	0.0	0.27	1.92	0.03	0.00	0.00	0.00	0.05	0.00	100.0
2000	10.29	86.79	0.1	0.35	2.33	0.01	0.00	0.00	0.00	0.14	0.02	100.0

Source: NPFMC Sector Profile Database, 2001.

Table 21 provides data on discards of YSOL by processing sector from 1992-2000. The largest discards of YSOL have historically occurred in the sectors with the greatest amount of harvests. The percentage of total YSOL discards represented by head and gut trawl catcher processors has been increasing in the past several years. In 2000, these vessels accounted for 90.2 percent of the total YSOL discards. The next largest share (5.25 percent) was discarded by surimi and fillet trawl catcher processors. The share of total discards represented by these vessels has been showing a downward trend in recent years.

The YSOL discard rates for both head and gut trawl catcher processors and surimi and fillet trawl catcher processors have declined over the years. Some sectors discard all or nearly all of the YSOL they catch, but the amount of YSOL caught and discarded by these sectors is generally small. This appears to be true of pot catcher processors, Alaska Peninsula and Aleutian Islands shore plants, floating processors and motherships. Shore plants in the Kodiak, Southcentral and Southeast Regions generally do not receive YSOL because they are situated in the GOA.

Table 21. Discards of BSAI Yellowfin Sole by Processing Sector for All Target Fisheries, 1992-2000

	ST&FT-CP	HT-CP	P-CP	L-CP	BSP-SP	APAI-SP	K-SP	SC-SP	SE-SP	MS	FLT	Total
Year	**Metric Tons (Thousands)**											
1992	12.77	26.80	0.00	0.06	0.16	0.00	0.00	0.00	0.00	2.67	0.38	42.83
1993	7.96	20.51	0.00	0.00	0.39	0.05	0.06	0.00	0.00	0.04	0.00	29.01
1994	11.32	22.72	0.00	0.15	0.53	0.04	0.00	0.00	0.00	0.02	0.36	35.13
1995	6.18	20.72	0.01	0.06	0.21	0.02	0.00	0.00	0.00	0.46	0.33	27.98
1996	9.09	17.70	0.07	0.18	1.01	0.13	0.00	0.00	0.00	0.01	0.14	28.34
1997	10.62	20.67	0.03	0.20	0.47	0.03	0.00	0.00	0.00	0.03	0.02	32.07
1998	3.25	17.04	0.07	0.26	0.20	0.01	0.00	0.00	0.00	0.02	0.01	20.86
1999	0.87	11.23	0.03	0.18	0.10	0.02	0.00	0.00	0.00	0.03	0.00	12.47
2000	0.74	12.72	0.06	0.28	0.18	0.01	0.00	0.00	0.00	0.10	0.01	14.10
Year	**Percent of Bering Sea Yellowfin Sole Discards**											
1992	29.82	62.57	0.0	0.13	0.36	0.00	0.00	0.00	0.00	6.23	0.88	100.0
1993	27.45	70.69	0.0	0.02	1.34	0.17	0.20	0.00	0.00	0.12	0.01	100.0
1994	32.21	64.67	0.0	0.43	1.51	0.10	0.00	0.00	0.00	0.05	1.02	100.0
1995	22.09	74.04	0.0	0.22	0.74	0.07	0.00	0.00	0.00	1.64	1.17	100.0
1996	32.10	62.47	0.2	0.64	3.57	0.45	0.00	0.00	0.00	0.03	0.51	100.0
1997	33.12	64.45	0.1	0.62	1.46	0.09	0.00	0.00	0.00	0.10	0.07	100.0
1998	15.59	81.69	0.3	1.23	0.96	0.06	0.00	0.00	0.00	0.10	0.03	100.0
1999	6.97	90.07	0.2	1.45	0.84	0.19	0.00	0.00	0.00	0.25	0.00	100.0
2000	5.25	90.21	0.4	1.98	1.25	0.08	0.00	0.00	0.00	0.73	0.09	100.0
Year	**Discards as a Percent of Bering Sea Yellowfin Sole Catch**											
1992	25.13	32.62	100.00	98.94	4.29	100.00	0.83	100.00	0.00	36.39	27.61	29.46
1993	21.91	29.86	100.00	97.98	99.82	100.00	18.96	0.00	0.00	100.00	100.00	27.42
1994	24.96	26.96	100.00	99.82	6.39	100.00	100.00	0.00	0.00	7.14	22.24	25.10
1995	15.79	29.44	100.00	99.33	2.73	100.00	100.00	0.00	0.00	15.91	6.93	22.43
1996	17.94	24.80	99.79	96.60	17.74	98.90	100.00	0.00	0.00	100.00	9.84	21.85
1997	24.46	16.64	100.00	91.06	3.15	99.93	0.00	0.00	0.00	100.00	100.00	17.54
1998	14.91	21.62	88.65	97.05	64.42	100.00	0.00	0.00	0.00	100.00	100.00	20.59
1999	7.40	20.07	99.43	97.38	7.82	100.00	0.00	0.00	0.00	99.97	100.00	17.99
2000	8.56	17.43	100.00	94.49	9.00	100.00	0.00	0.00	0.00	87.31	100.00	16.77

Source: NPFMC Sector Profile Database, 2001.

Table 22 presents SFLT catch data for processing sectors from 1992-2000. The total catch of this species complex is small when compared with the catch of YSOL and RSOL. Further, since SFLT is a GOA species complex, processing sectors that do not participate in that region typically have little or no harvest of SFLT. These sectors include all of the catcher processors except head and gut trawl catcher processors, which have historically harvested 5 percent to 12 percent of the total annual catch of SFLT. While it is true that fillet trawl catcher processors have also harvested SFLT, they account for less than one-half of 1 percent of the total catch in all years except 1992. Among the inshore processors in recent years, a catch of SFLT exceeding one metric ton has been recorded only by the Kodiak shore plants.

Table 22. Catch of Gulf of Alaska Shallow-water Flatfish by Processing Sector for All Target Fisheries, 1992-2000

	ST&FT-CP	HT-CP	P-CP	L-CP	BSP-SP	APAI-SP	K-SP	SC-SP	SE-SPMS		FLT	Total
Year	**Total Catch Metric Tons (Thousands)**											
1992	0.13	0.91	0.00	0.01	1.20	0.55	4.78	0.04	0.00	0.02	0.73	8.37
1993	0.02	0.72	0.00	0.02	0.07	0.34	8.33	0.09	0.00	0.00	0.04	9.65
1994	0.00	0.22	0.00	0.00	0.00	0.17	3.33	0.06	0.00	0.00	0.01	3.80
1995	0.01	0.48	0.01	0.01	0.08	0.19	4.61	0.02	0.00	0.02	0.01	5.43
1996	0.02	1.06	0.00	0.00	0.02	0.12	8.10	0.04	0.00	0.00	0.00	9.37
1997	0.01	0.51	0.00	0.00	0.07	0.25	6.85	0.05	0.00	0.00	0.00	7.75
1998	0.01	0.21	0.00	0.00	0.02	0.18	3.06	0.08	0.00	0.00	0.00	3.56
1999	0.03	0.13	0.00	0.02	0.00	0.10	2.21	0.02	0.00	0.00	0.03	2.54
2000	0.00	0.56	0.00	0.00	0.01	0.11	6.23	0.01	0.00	0.00	0.02	6.93
Year	**Percent of Gulf of Alaska Shallow-water Flatfish Catch**											
1992	1.53	10.92	0.00	0.06	14.30	6.53	57.11	0.53	0.01	0.26	8.75	100.00
1993	0.23	7.51	0.00	0.23	0.73	3.57	86.36	0.91	0.02	0.00	0.45	100.00
1994	0.11	5.80	0.00	0.04	0.08	4.48	87.67	1.68	0.00	0.00	0.14	100.00
1995	0.14	8.84	0.14	0.25	1.41	3.47	84.82	0.35	0.00	0.34	0.23	100.00
1996	0.23	11.36	0.00	0.03	0.25	1.23	86.46	0.42	0.00	0.00	0.01	100.00
1997	0.18	6.59	0.00	0.05	0.95	3.21	88.35	0.65	0.00	0.00	0.00	100.00
1998	0.33	5.88	0.00	0.06	0.50	4.96	85.88	2.37	0.02	0.00	0.00	100.00
1999	1.00	4.99	0.01	0.84	0.12	4.04	86.87	0.83	0.10	0.00	1.21	100.00
2000	0.00	8.01	0.00	0.05	0.07	1.52	89.91	0.07	0.03	0.00	0.33	100.00

Source: NPFMC Sector Profile Database, 2001.

Table 23 provides data on the discards of SFLT by processing sectors from 1992-2000. Again, the largest amounts of discards have been in the sectors with the largest catches. These sectors are the Kodiak shore plants, head and gut trawl catcher processors, Alaska Peninsula and Aleutian Islands shore plants and, at times, Bering Sea pollock shore plants. Kodiak shore plants have generally accounted for the largest share of total discards. In 2000, however, the SFLT discards by head and gut trawl catcher processors exceeded those of Kodiak shore plants.

Table 23. Discards of Gulf of Alaska Shallow-water Flatfish by Processing Sector for All Target Fisheries, 1992-2000

	ST&FT-CP	HT-CP	P-CP	L-CP	BSP-SP	APAI-SP	K-SP	SC-SP	SE-SP	MS	FLT	Total
Year	**Discard Metric Tons (Thousands)**											
1992	0.05	0.37	0.00	0.01	0.46	0.55	0.81	0.04	0.00	0.01	0.30	2.59
1993	0.02	0.32	0.00	0.00	0.06	0.34	2.59	0.02	0.00	0.00	0.04	3.40
1994	0.00	0.13	0.00	0.00	0.00	0.17	0.70	0.02	0.00	0.00	0.01	1.04
1995	0.00	0.15	0.01	0.01	0.07	0.19	1.12	0.02	0.00	0.02	0.01	1.60
1996	0.02	0.22	0.00	0.00	0.00	0.12	0.94	0.00	0.00	0.00	0.00	1.30
1997	0.01	0.15	0.00	0.00	0.07	0.25	1.35	0.03	0.00	0.00	0.00	1.86
1998	0.01	0.07	0.00	0.00	0.02	0.18	0.31	0.02	0.00	0.00	0.00	0.60
1999	0.01	0.07	0.00	0.02	0.00	0.10	0.32	0.02	0.00	0.00	0.01	0.55
2000	0.00	0.35	0.00	0.00	0.00	0.10	0.30	0.00	0.00	0.00	0.02	0.78
Year	**Percent of Gulf of Alaska Shallow-water Flatfish Discards**											
1992	1.97	14.11	0.00	0.20	17.93	21.08	31.23	1.72	0.02	0.26	11.48	100.00
1993	0.54	9.45	0.00	0.12	1.74	10.11	76.11	0.67	0.00	0.00	1.27	100.00
1994	0.37	12.98	0.00	0.14	0.10	16.39	67.61	1.90	0.00	0.00	0.51	100.00
1995	0.26	9.18	0.33	0.84	4.33	11.78	70.16	1.15	0.01	1.17	0.80	100.00
1996	1.67	16.59	0.00	0.19	0.06	8.86	72.27	0.31	0.00	0.00	0.05	100.00
1997	0.75	8.12	0.00	0.22	3.73	13.35	72.36	1.45	0.02	0.01	0.00	100.00
1998	1.90	11.63	0.00	0.33	2.59	29.26	51.74	2.51	0.04	0.00	0.00	100.00
1999	1.98	12.77	0.03	3.77	0.47	18.51	57.56	3.25	0.48	0.00	1.18	100.00
2000	0.00	45.02	0.00	0.40	0.57	12.91	37.97	0.30	0.27	0.00	2.57	100.00
Year	**Discards as a Percent of Sector Gulf of Alaska Shallow-water Flatfish Catch**											
1992	39.95	39.99	0.00	100.00	38.81	99.91	16.92	100.00	100.00	30.84	40.59	30.95
1993	83.26	44.36	0.00	18.06	84.09	100.00	31.08	26.03	0.49	0.00	100.00	35.27
1994	88.28	61.19	0.00	100.00	35.15	99.99	21.09	31.06	0.00	0.00	100.00	27.35
1995	56.17	30.57	70.03	99.41	90.42	100.00	24.36	95.78	100.00	100.00	100.00	29.45
1996	100.00	20.27	0.00	98.01	3.36	100.00	11.60	10.07	0.00	0.00	100.00	13.88
1997	99.50	29.66	0.00	100.00	94.04	99.98	19.70	53.18	100.00	100.00	0.00	24.06
1998	97.03	33.47	0.00	98.99	87.17	99.93	10.20	17.92	38.60	0.00	0.00	16.92
1999	43.27	55.72	100.00	97.38	89.42	99.56	14.41	84.72	100.00	0.00	21.25	21.75
2000	0.00	63.17	100.00	83.60	87.15	95.33	4.75	45.74	100.00	0.00	88.51	11.25

Source: NPFMC Sector Profile Database, 2001.

Discard rates show considerable variability from year to year. Bering Sea pollock shore plants, for example, have had a discard rate as low as 3.4 percent and as high as 94.0 percent. Kodiak shore plants have historically had some of the lowest discard rates, and their discard rate declined to a low of 4.75 percent in 2000. Head and gut trawl catcher processors have had discard rates that vary between 20.3 percent and 63.2 percent. The discard rates of Alaska Peninsula and Aleutian Islands shore plants have been near 100 percent in most years, although their SFLT catch is relatively small.

Several sectors have not had measurable catches or discards of SFLT in recent years. These include the surimi and fillet trawl, pot and longline catcher processors, Bering Sea, Southcentral and Southeast shore plants, motherships and floating processors.

In an effort to examine these data from a perspective most relevant to the issue of retention and discard, a processor sector analysis of discards as a percent of total product is treated in detail in Section 3.2.4 of the RIR.

2.2.3 Description of Catcher Vessel Sectors Potentially Affected by IR/IU Flatfish Rules

As indicated in the discussion of processing sectors, there do not appear to be any fixed gear catcher vessel fisheries with significant discards of IR/IU flatfish and only the following three trawl catcher vessel fisheries have appreciable IR/IU flatfish discards: BSAI Pacific cod, GOA Pacific cod and GOA shallow-water flatfish.

This section analyzes historical catches and discards of IR/IU flatfish by different classes of trawl catcher vessels. The analysis is preceded by a discussion of data issues related to estimating discards by catcher vessels.

2.2.3.1 Estimating Discards by Catcher Vessels

When catcher vessels make deliveries to processors both at-sea and dockside discards are supposed to be recorded on ADF&G groundfish fish tickets. However, because fish tickets are generally regarded as a bill of sale, only those discards that occur at the shore plant (and for which the vessel may not be paid) are often recorded. To obtain a more reliable estimate of at-sea discards by catcher vessels, NMFS performs a statistical evaluation of observer data. Observer records are believed to be adequate to make reliable estimates of total catch and catch composition for a fishery in a given area. These fishery-wide estimates are used to augment data recorded in weekly production reports submitted by shore plants and inshore floating processors. The resulting "blend data" from industry production reports and observer reports are used to make the best, comprehensive accounting of total catches and discards.

The differential observer coverage across vessels, the fact that even when an observer is onboard all catches made by a vessel may not be sampled and possible errors introduced by observer sampling techniques preclude the use of blend data to estimate the catch and discards of individual catcher vessels. However, it is possible to estimate IR/IU flatfish discards for various trawl catcher vessel classes based on species composition and discard estimates at various processors and the percent of landings made to these processors in target fisheries by each type of vessel. In this estimation process, discard estimates are extrapolated from data assigned to processors. Consequently, differences or similarities in the estimated discard rates across trawl catcher vessel classes reflect the proportion of deliveries made to various processors rather than behavioral differences among the catcher vessels themselves. Thus, if two trawl vessel classes delivered their BSAI Pacific cod exclusively to Bering Sea pollock shore plants, their estimated discard rates would be identical.

2.2.3.2 Summary Description of Catcher Vessel Sectors

This section provides an overview of the trawl catcher vessel classes used in this analysis and summarizes estimates of IR/IU flatfish discards by these vessel classes in the BSAI and GOA Pacific cod fisheries and in the SFLT fishery. Discards of IR/IU flatfish are highest in the BSAI Pacific cod fishery both in terms of volume and percent by weight of retained groundfish. During the 1992-2000 period, discards of RSOL and YSOL were 12.6 percent of the total amount of groundfish retained. In the same period, discards of SFLT in the GOA Pacific cod fishery were only 1.6 percent of total retained groundfish, while discards of SFLT in the SFLT target fishery were 9.8 percent of the total amount of groundfish retained.

Five classes of trawl vessels are defined based on participation patterns and vessel length (Table 24). These vessel classes are the same as those developed for the report, *Sector and Regional Profiles of the North Pacific Groundfish Fisheries—2001* (Northern Economics, Inc. and EDAW, Inc. 2001).

Table 24. Catcher Vessel Classes

Class	Acronym	Description
Bering Sea pollock Trawl Catcher Vessels Greater than or Equal to 125 Feet in Length	TCV BSP ≥ 125	Includes all vessels for which trawl catch accounts for more than 15 percent of total catch value, value of Bering Sea pollock catch is greater than value of catch of all other species combined, vessel length is greater than or equal to 125 ft., and total value of groundfish catch is greater than $5000. All of these vessels fishing after 1998 are AFA-eligible.
Bering Sea pollock Trawl Catcher Vessels 60 to 124 Feet in Length	TCV BSP 60-124	Includes all vessels for which trawl catch accounts for more than 15 percent of total catch value, value of Bering Sea pollock catch is greater than value of catch of all other species combined, vessel length is 60 ft. to 124 ft., and total value of groundfish catch is greater than $5000. All of these vessels fishing after 1998 are AFA-eligible.
Diversified AFA-Eligible Trawl Catcher Vessels	TCV Div. AFA	Includes all vessels that are AFA-eligible for which trawl catch accounts for more than 15 percent of total catch value, value of Bering Sea pollock catch is less than value of catch of all other species combined, vessel length is greater than or equal to 60 ft., and total value of groundfish catch is greater than $5000.
Non-AFA Trawl Catcher Vessels	TCV Non-AFA	Includes all vessels that are not AFA-eligible for which trawl catch accounts for more than 15 percent of total catch value, value of Bering Sea pollock catch is less than value of catch of all other species combined, vessel length is greater than or equal to 60 ft., and total value of groundfish catch is greater than $5000.
Trawl Catcher Vessels Less than 60 Feet in Length	TCV < 60	Includes all vessels for which trawl catch accounts for more than 15 percent of total catch value, vessel length is less than 60 ft., and total value of groundfish catch is greater than $2500.

Note: For a given year each vessel participating in the groundfish fisheries was assigned to one vessel class. The class to which a vessel was assigned could change from year to year based on the vessel's fishing activities. In addition to the trawl catcher vessel classes, vessels could be assigned to fixed gear vessel classes. Because fixed-gear catcher vessel do not appear to be directly affected by the proposed alternatives they are not included.

The vessels in the first two trawl catcher vessel classes (TCV BSP ≥ 125 and TCV BSP 60-124) are eligible to harvest the directed fishing allowance under Section (b)(1) of the American Fisheries Act and focus almost exclusively on Bering Sea pollock. The two classes differ in that the larger vessels can carry significantly more fish in their holds and are able to fish much farther from shore. Vessels in the third class (TCV Div. AFA) are also AFA-eligible, but they generate less total revenue in the BSAI pollock fisheries than they do in other trawl fisheries, such as those occurring in the GOA. This class generally consists of vessels between 60 and 124 feet in length (LOA) but in some years includes one or two vessels longer than 124 feet. Vessels in the fourth class (TCV Non-AFA) are not AFA-eligible and, therefore, do not have access to the lucrative BSAI pollock fisheries. Instead, these vessels focus their fishing effort in the GOA. These vessels are all greater than 60 feet long. Vessels in the final class (TCV < 60) are all less than 60 feet in length and fish almost exclusively in the GOA. Most of these vessels also participate in Alaska salmon fisheries with purse seine gear. State regulations prohibit the use of vessels longer than 58 feet in salmon seine fisheries.

Table 25 shows the total ex-vessel value of the catch of all trawl catcher vessels by species from 1992-2000. Over 75 percent of trawl catcher vessel gross revenue was generated from landings of pollock and 20 percent was generated in Pacific cod fisheries. Only 3 percent of trawl catcher vessel gross revenue was generated from landings of flatfish. Moreover, since 1998, flatfish have accounted for only 1 percent of total gross revenue. Clearly, pollock and Pacific cod are the mainstay of trawl catcher vessels, and because bottom trawling for pollock was prohibited in 1999, IR/IU flatfish regulation are likely to affect only those trawl catcher vessels that participate in Pacific cod fisheries. An exception to this generalization may be found among those vessels that participate in the relatively small SFLT fishery.

Table 25. Ex-Vessel Value ($Millions) of Catch of All Trawl Catcher Vessels by Species, 1992-2000

	BSAI				GOA				
Year	FLAT	ROCK	PCOD	PLCK	FLAT	ROCK	PCOD	PLCK	Total
1992	6.53	0.05	10.16	144.86	3.09	0.30	18.47	19.22	206.31
1993	0.19	0.02	10.42	81.00	2.83	0.13	12.01	15.39	124.12
1994	2.26	0.01	10.97	90.31	1.79	0.13	8.83	17.76	136.46
1995	3.30	0.04	15.80	121.75	2.43	0.23	14.98	13.64	175.36
1996	0.79	0.01	19.60	100.08	4.07	0.74	13.80	9.34	152.73
1997	8.86	0.02	22.10	157.77	5.88	1.41	19.02	19.00	238.40
1998	0.12	0.05	13.68	73.50	2.24	0.93	13.59	19.30	125.79
1999	0.21	0.01	18.45	110.10	1.35	1.14	22.85	20.05	176.74
2000	0.54	0.00	23.46	151.31	2.22	2.21	17.50	16.83	217.26

Source: CFEC fish-ticket data provided by the NPFMC, 2001.
Total column includes catches of other groundfish, including Atka mackerel, and sablefish.

Table 26 shows the estimated annual discards of IR/IU flatfish by all trawl catcher vessels in the BSAI and GOA Pacific cod fisheries and SFLT fishery. For each fishery, the table shows the amount of discarded IR/IU flatfish by species or species complex in terms of volume (a "D-" followed by the abbreviation for metric tons) and percent by weight of retained groundfish (a "D-" followed by a percent sign). For example, **D-RSOL (mt)** indicates the tons of discarded RSOL, while **D-SFLT (%)** indicates discards of SFLT as a percent of retained groundfish tons (**R-GFSH (mt)**). Thus, in the 2000 BSAI Pacific cod fishery there were approximately 1,594 mt of discarded RSOL, 142 mt of discarded YSOL and 39,135 mt of retained groundfish. Discards of rock sole amounted to 4.1 percent by weight of retained groundfish while discards of yellowfin sole were 0.4 percent by weight of retained groundfish. In the 2000 GOA Pacific cod fishery, the 222 mt of discarded SFLT was 1.0 percent of the 21,351 mt of retained groundfish. Discards of SFLT in the SFLT fishery amounted to 1.9 percent of the 7,470 mt of retained groundfish.

Overall, it appears that trawl catcher vessel discards of IR/IU flatfish have decreased in recent years. In 2000, IR/IU flatfish discards in the BSAI PCOD fishery were 4.5 percent of retained groundfish as compared to 12.6 percent over the entire 1992-2000 period. Similarly, average flatfish discards in the shallow-water flatfish fishery fell to 1.9 percent in 2000.

Table 26. IR/IU Flatfish Discards by All Trawl Catcher Vessels, 1992-2000

	BSAI Pacific Cod Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	751	175	19,444	3.9	0.9	1,108	42,306	2.6	339	5,166	6.6
1993	2,868	411	24,245	11.8	1.7	677	30,452	2.2	1,384	6,678	20.7
1994	4,994	445	35,117	14.2	1.3	398	27,799	1.4	365	2,584	14.1
1995	5,837	120	35,578	16.4	0.3	648	33,392	1.9	493	3,113	15.8
1996	5,650	977	44,267	12.8	2.2	279	34,633	0.8	596	7,096	8.4
1997	6,899	322	42,799	16.1	0.8	781	42,689	1.8	488	4,868	10.0
1998	2,387	174	32,744	7.3	0.5	386	33,466	1.2	99	2,181	4.5
1999	4,362	46	29,381	14.8	0.2	271	33,507	0.8	53	1,004	5.2
2000	1,594	142	39,135	4.1	0.4	222	21,351	1.0	143	7,470	1.9

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

Table 27 shows the estimated IR/IU flatfish discards by each trawl catcher vessel class. Vessels in the TCV BSP ≥ 125 and TCV BSP 60-125 classes expend relatively little fishing effort in the GOA. Because discards in the BSAI PCOD fishery are higher than discards in the GOA fisheries, the average percentage of IR/IU flatfish discards of these two vessel classes are higher than discard percentages of vessels in the other classes.

Table 27. IR/IU Flatfish Discards by Each Trawl Catcher Vessel Class, 1992-2000

	TCV BSP ≥ 125			TCV BSP 60-124			TCV Div. AFA			TCV Non-AFA			TCV < 60		
	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT
Year	Discarded IR/IU Flatfish as a Percent of Retained Groundfish														
1992	4.5	2.5	6.8	5.5	2.6	6.2	4.2	2.6	6.8	4.1	2.6	6.6	0.0	2.7	6.0
1993	14.4	2.1	20.9	14.4	2.0	20.4	12.4	2.3	20.9	13.1	2.3	20.8	0.0	2.1	20.2
1994	16.2	0.0	14.1	15.2	1.1	0.0	15.8	1.8	14.1	15.6	1.6	14.1	0.0	1.2	14.1
1995	16.8	1.7	15.8	16.5	1.4	15.8	17.6	2.2	15.8	16.3	2.1	15.8	0.0	2.0	15.8
1996	15.5	0.6	0.0	14.7	0.5	8.4	15.2	0.9	8.4	15.0	1.0	8.4	0.0	0.7	8.4
1997	16.5	1.8	10.0	17.7	1.5	10.0	15.6	2.3	10.0	16.7	2.3	10.0	0.0	1.4	10.0
1998	8.0	1.8	4.6	7.8	1.1	4.5	7.9	1.2	4.5	6.0	1.2	4.5	0.0	1.1	4.5
1999	15.1	0.7	0.0	15.1	0.8	5.2	14.8	0.9	5.2	15.7	0.8	5.2	0.0	0.8	5.2
2000	4.8	1.1	0.0	4.5	1.2	1.9	4.3	1.1	1.9	3.7	1.0	1.9	0.0	1.0	1.9

Source: Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

2.2.3.3 Sector Level Analysis of Catcher Vessels

Bering Sea Pollock Trawl Catcher Vessels Greater than or Equal to 125 Feet in Length

This catcher vessel class includes all vessels for which trawl catch accounts for more than 15 percent of total catch value, the value of Bering Sea pollock catch is greater than the value of the catch of all other species combined, vessel length is greater than or equal to 125 ft., and the total value of groundfish catch is greater than $5,000. All of these vessels fishing after 1998 are AFA-eligible.

The vessels in this class have high horsepower engines and can tow very large trawls, which allow for larger catches. They also have very large fish holds, which allow them to extend their trips to the maximum feasible time while still maintaining high fish quality—typically 36 to 48 hours after the first fish is caught. The combination of high horsepower and large fish holds make these vessels very efficient in the high-volume BSAI pollock fishery—particularly as regulatory changes move this fishery farther from shore. All vessels in this class have auxiliary engines to control their nets, and this equipment enables them to operate their pelagic trawls at depths just above ocean bottom.

In 2000, vessels in the TCV BSP ≥ 125 class had an average length of 153 feet and ranged from 125 to 193 feet. Most were less than 155 feet. The vessels in this class have an average horsepower rating of about 2,475, with a maximum of about 6,600 and a minimum of 1,125. Average gross tonnage is approximately 310 tons and average hold capacity is 13,500 cubic feet. The hold capacity of these vessels is approximately 73 percent higher than the hold capacity of vessels in the TCV BSP 60-124 class.

Table 28 shows the ex-vessel value of catch by Bering Sea pollock trawl catcher vessels greater than or equal to 125 feet in length by species and area. In addition to the BSAI pollock fishery—which accounts for over 85 percent of their gross revenue—these vessels participate in the BSAI PCOD fishery but have relatively little activity in the GOA PCOD and SFLT fisheries.

Table 28. Ex-Vessel Value ($Millions) of Catch of Bring Sea Pollock Trawl Catcher Vessels Greater than or Equal to 125 Feet in Length by Species, 1992-2000

	BSAI				GOA				
Year	FLAT	ROCK	PCOD	PLCK	FLAT	ROCK	PCOD	PLCK	Total
1992	0.8	0.0	0.8	51.5	0.1	a	0.5	1.7	55.5
1993	0.0	0.0	1.5	32.0	0.0	a	0.3	1.2	35.0
1994	0.4	0.0	1.5	35.4	0.0	0.0	0.0	1.8	39.2
1995	0.5	0.0	2.0	43.7	0.0	0.0	0.8	2.3	49.5
1996	0.4	0.0	4.3	43.0	0.0	a	0.4	1.0	49.0
1997	5.4	0.0	4.7	87.6	0.0	0.0	0.5	2.2	100.4
1998	0.0	0.0	2.2	35.1	0.0	0.0	0.1	2.1	39.6
1999	0.2	0.0	4.0	58.4	0.0	0.0	0.2	1.8	64.6
2000	0.4	0.0	3.4	75.5	a	a	a	a	79.5

Source: CFEC Fish-ticket Data provided by the NPFMC, 2001.
a: Omitted because of NMFS data confidentiality policies.
Total column includes catches of other groundfish, including Atka mackerel and sablefish, and includes vessels omitted because of NMFS data confidentiality policies.

Table 29 shows that in 2000, discards of IR/IU flatfish by vessels in the TCV BSP ≥125 class in the Pacific cod fishery were 4.8 percent of retained groundfish. Approximately 90 percent of the discards were RSOL. IR/IU flatfish discards in 2000 were the lowest in the 1992-2000 period, during which discards in the three fisheries averaged 11.8 percent of retained groundfish.

Table 29. IR/IU Flatfish Discards by Bering Sea Pollock Trawl Catcher Vessels ≥ 125 Feet, 1992-2000

	BSAI Pacific Cod Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	66	7	1,624	4.1	0.4	39	1,561	2.5	10	141	6.8
1993	366	57	2,932	12.5	1.9	13	643	2.1	3	14	20.9
1994	727	64	4,891	14.9	1.3	0	0	0.0	3	18	14.1
1995	757	15	4,601	16.5	0.3	41	2,411	1.7	1	4	15.8
1996	1,241	216	9,376	13.2	2.3	7	1,127	0.6	0	0	0.0
1997	1,403	66	8,892	15.8	0.7	26	1,427	1.8	2	21	10.0
1998	400	29	5,383	7.4	0.5	6	346	1.8	0	10	4.6
1999	967	10	6,476	14.9	0.2	2	307	0.7	0	0	0.0
2000	243	23	5,493	4.4	0.4	2	196	1.1	0	0	0.0

Source: Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

Bering Sea pollock Trawl Catcher Vessels 60 to 124 Feet in Length

This catcher vessel class includes all vessels for which trawl catch accounts for more than 15 percent of total catch value, the value of Bering Sea pollock catch is greater than the value of the catch of all other species combined, vessel length is 60 ft. to 124 ft. and the total value of groundfish catch is greater than $5,000. All of these vessels fishing after 1998 are AFA-eligible. Vessels in this class are similar to vessels in the TCV BSP ≥ 125 class. The key difference between the two classes is vessel size. Because of their relatively small hold sizes, many of the vessels in this class deliver their pollock to motherships or to catcher processors. In 2000, over 42 percent of the ex-vessel value of the catch of the TCV BSP 60-124 class was generated by at-sea deliveries.

In 2000, vessels in the TCV BSP 60-124 class had an average length of 113 feet and ranged from 81 to 124 feet. Most were less than 120 feet. The vessels have an average horsepower rating of about 1,330, with a maximum of about 2,000 and a minimum of 730. Average gross tonnage is approximately 210 tons. The average hold capacity of these vessels is 7,763 cubic feet or approximately 42 percent less than the hold capacity of the larger TCV BSP ≥ 125 vessels.

Table 30 shows the ex-vessel value of the catch of vessels in the TCV BSP 60-124 class by species and area. Like the previous class, these vessels concentrate most of their effort in the BSAI pollock fishery. However, compared to the larger vessels in the TCV BSP ≥ 125 class, TCV BSP 60-124 vessels have relatively higher levels of participation in the BSAI and GOA PCOD fisheries. The drop in activity in the GOA PCOD fishery in recent years is likely due to fishing opportunities created by AFA and harvest sideboards. Table 31 shows that since 1992, the amount of IR/IU flatfish discarded by these vessels is equal to 11.9 percent of the retained groundfish.

Table 30. Ex-Vessel Value ($Millions) of Catch of Bering Sea Pollock Trawl Catcher Vessels 60 to 124 Feet in Length by Species, 1992-2000

	BSAI				GOA				
Year	FLAT	ROCK	PCOD	PLCK	FLAT	ROCK	PCOD	PLCK	Total
1992	0.4	0.0	4.4	85.2	0.0	0.0	1.0	4.0	95.1
1993	0.0	0.0	4.1	45.8	0.1	0.0	0.0	2.0	52.1
1994	0.9	0.0	6.7	52.7	0.0	0.0	0.4	3.0	63.8
1995	1.8	0.0	9.1	71.1	0.4	0.0	1.9	4.0	88.8
1996	0.3	0.0	10.8	53.2	0.8	0.3	0.7	1.2	68.3
1997	0.3	0.0	10.3	65.3	0.4	0.1	0.9	2.2	79.9
1998	0.1	0.0	5.1	35.0	0.2	0.1	0.8	1.9	43.4
1999	0.0	0.0	6.1	45.7	0.0	0.1	0.6	1.3	53.9
2000	0.1	0.0	10.2	71.0	0.0	0.2	0.3	0.7	82.7

Source: CFEC Fish-ticket Data provided by the NPFMC, 2001.
Total column includes catches of other groundfish, including Atka mackerel and sablefish, and includes vessels omitted because of NMFS data confidentiality policies.

Table 31. IR/IU Flatfish Discards of Bering Sea Pollock Trawl Catcher Vessels 60-124 Feet, 1992-2000

	BSAI Pacific Cod Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	320	127	8,095	4.0	1.6	59	2,316	2.6	18	288	6.2
1993	1,224	190	9,816	12.5	1.9	0	12	2.0	42	205	20.4
1994	3,080	278	22,034	14.0	1.3	12	1,148	1.1	0	0	0.0
1995	3,337	69	20,674	16.1	0.3	67	4,987	1.4	30	188	15.8
1996	3,070	517	24,438	12.6	2.1	10	1,872	0.5	70	834	8.4
1997	3,457	154	20,421	16.9	0.8	37	2,386	1.5	26	259	10.0
1998	844	61	11,566	7.3	0.5	25	2,361	1.1	11	248	4.5
1999	1,422	15	9,518	14.9	0.2	10	1,287	0.8	1	19	5.2
2000	707	65	17,099	4.1	0.4	5	403	1.2	2	107	1.9

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

Diversified AFA-Eligible Trawl Catcher Vessels Greater than or Equal to 60 Feet in Length

The Diversified AFA-eligible Trawl Catcher Vessel ≥ 60 Feet Class (TCV Div. AFA) includes all vessels that are AFA-eligible for which trawl catch accounts for more than 15 percent of total catch value, the value of Bering Sea pollock catch is less than the value of the catch of all other species combined, vessel length is greater than or equal to 60 ft. and the total value of groundfish catch is greater than $5,000. Vessels in the TCV Div. AFA class are more diversified in fishing effort than vessels in the TCV BSP ≥ 125 and TCV BSP 60-124 classes, but they are also eligible under AFA to participate in the BSAI pollock fishery. Vessels in the TCV Div. AFA class have significant participation in the GOA pollock fishery and the BSAI and GOA Pacific cod fisheries. Some vessels in the class also participate in the Pacific whiting fishery off the coasts of Oregon and Washington.

In 2000, vessels in the TCV Div AFA class had an average length of 92 feet and ranged from 73 to 123 feet. Most vessels were less than 95 feet long. The vessels have an average horsepower rating of about 995, with a maximum of about 1,750 and a minimum of 630. Average gross tonnage is approximately 170 tons and average hold capacity is 4,866 cubic feet—38 percent less hold space on average than vessels in the TCV BSP 60-124 class.

Table 32 shows the ex-vessel value of the catch of diversified AFA-eligible trawl catcher vessels greater than or equal to 60 feet in length. Unlike the two previous classes, these vessels generate more than half of their revenue outside the BSAI pollock fishery. The BSAI PCOD fishery and the GOA PLCK fishery both generate more revenue than the BSAI PLCK fishery.

Table 32. Ex-Vessel Value ($Millions) of Catch of Diversified AFA-Eligible Trawl Catcher Vessels Greater than or Equal to 60 Feet in Length by Species, 1999-2000

	BSAI				GOA				
Year	FLAT	ROCK	PCOD	PLCK	FLAT	ROCK	PCOD	PLCK	Total
1992	4.8	0.1	2.8	7.6	1.2	0.2	5.1	9.5	33.4
1993	0.0	0.0	3.5	3.0	1.0	0.1	3.4	8.5	20.0
1994	0.3	0.0	1.7	2.1	0.7	0.1	2.1	8.4	16.4
1995	0.4	0.0	3.5	6.6	0.7	0.1	3.2	2.9	18.1
1996	0.1	0.0	3.5	3.5	0.4	0.2	1.6	2.1	11.8
1997	0.0	0.0	4.7	4.6	1.4	0.3	4.2	5.9	22.1
1998	0.0	0.0	5.8	3.2	0.7	0.4	2.7	7.1	20.4
1999	0.0	0.0	7.2	5.5	0.5	0.6	5.5	8.4	28.4
2000	0.0	0.0	8.0	4.0	0.7	0.8	2.9	8.1	25.3

Source: CFEC Fish-ticket Data provided by the NPFMC, 2001.

Total column includes catches of other groundfish, including Atka mackerel and sablefish, and includes vessels omitted because of NMFS data confidentiality policies.

Table 33 shows that since 1992 the amount of IR/IU flatfish discarded by these vessels is equal to 7.5 percent of the retained groundfish, except in 2000, when discards of IR/IU flatfish were only 3.5 percent of retained groundfish.

Table 33. IR/IU Flatfish Discards by Diversified AFA Trawl Catcher Vessels, 1992-2000

	BSAI Pacific Cod Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	214	19	5,503	3.9	0.3	289	11,301	2.6	68	1,000	6.8
1993	967	125	8,813	11.0	1.4	193	8,426	2.3	199	955	20.9
1994	770	67	5,280	14.6	1.3	112	6,076	1.8	95	669	14.1
1995	1,320	28	7,647	17.3	0.4	148	6,860	2.2	164	1,037	15.8
1996	1,053	188	8,163	12.9	2.3	36	4,048	0.9	32	380	8.4
1997	1,491	74	10,039	14.8	0.7	196	8,381	2.3	101	1,008	10.0
1998	1,074	77	14,538	7.4	0.5	79	6,496	1.2	22	485	4.5
1999	1,747	18	11,926	14.6	0.2	69	8,120	0.9	8	145	5.2
2000	546	47	13,678	4.0	0.3	40	3,841	1.1	24	1,236	1.9

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

Non-AFA Trawl Catcher Vessels Greater than or Equal to 60 Feet in Length

This class includes all vessels that are not AFA-eligible for which trawl catch accounts for more than 15 percent of total catch value, the value of Bering Sea pollock catch is less than the value of the catch of all other species combined, vessel length is greater than or equal to 60 ft. and the total value of groundfish catch is greater than $5,000.

These trawlers are not eligible to participate in the BSAI pollock fisheries and they are generally shorter than the trawlers in the three classes of AFA-eligible vessels discussed above. On the other hand, the fact that the vessels in this class are longer than 58 feet and, therefore, cannot participate in commercial salmon seine fisheries in Alaska distinguishes them from smaller trawlers that are not AFA-eligible (some vessels in this class with a record of participation in commercial salmon seine fisheries prior to 1976 were allowed to continue to participate in these fisheries).

Vessels in the TCV Non-AFA class typically were constructed for use in multiple fisheries. These vessels tend to have the cabin set forward, a relatively large working deck aft and fish holds amidships. Most vessels in this class are steel, although some are constructed of aluminum or fiberglass. As vessel length increases, the vessels tend to have higher freeboard, deeper draft, greater ballast and equipment that enables them to fish in weather conditions that would be impossible for smaller vessels.

About 90 percent of the vessels in this class have refrigeration systems. Almost all of the vessels are equipped with a stern ramp, a stern gantry, one forward and one aft net reel, twin trawl winches and a variety of lifting gear. Most of the vessels in the class have large below-deck RSW tanks for holding their round fish catch. Hold size and RSW systems become more important as the distance to the fishing grounds increases. Vessels with smaller fish holds and without RSW systems have a competitive disadvantage relative to vessels that possess RSW systems and large fish holds. Almost all vessels in this class have auxiliary engines to control their net, enabling them to operate pelagic trawl nets at depths near the bottom.

In 2000, vessels in the TCV Non-AFA class had an average length of 83 feet and ranged from 60 to 112 feet. Most were less than 90 feet. The vessels have an average horsepower rating of about 660, with a maximum of about 1,280 and a minimum of 350. Average gross tonnage is approximately 140 tons. The average hold capacity of these vessels is 3,550 cubic feet—28 percent less than vessels in the TCV Div AFA class.

Table 34 shows the ex-vessel value of the catch of non-AFA trawl catcher vessels greater than or equal to 60 feet in length. While these vessels as a class have had relatively little activity in the BSAI, a few vessels appear to be very dependent on the BSAI PCOD fishery. Most of the other vessels concentrate their effort in GOA trawl fisheries, generating roughly equal amounts of revenue in the Pacific cod fishery and pollock fishery. The shallow-water flatfish fishery is also important to this class.

Table 34. Ex-Vessel Value ($Millions) of Catch of Non-AFA Trawl Catcher Vessels Greater than or Equal to 60 Feet in Length by Species, 1992-2000

	BSAI				GOA				
Year	FLAT	ROCK	PCOD	PLCK	FLAT	ROCK	PCOD	PLCK	Total
1992	0.5	0.0	2.1	0.3	1.6	0.1	4.5	3.4	13.3
1993	0.1	a	1.2	0.2	1.6	0.0	3.3	2.8	9.7
1994	0.6	a	1.1	0.1	1.0	0.1	2.1	3.0	9.0
1995	0.5	a	1.2	0.3	1.0	0.1	4.6	2.9	11.3
1996	0.0	a	1.1	0.4	2.1	0.3	4.3	3.2	12.5
1997	3.2	a	2.4	0.2	3.6	0.9	5.6	5.0	22.2
1998	0.0	a	0.6	0.1	1.2	0.4	3.7	5.4	11.9
1999	0.0	a	1.1	0.5	0.8	0.5	7.3	5.8	16.7
2000	0.0	a	1.7	0.2	1.4	1.2	5.1	5.7	16.4

Source: CFEC Fish-ticket Data provided by the NPFMC, 2001.

a: Omitted because of NMFS data confidentiality policies.

Total column includes catches of other groundfish, including Atka mackerel and sablefish, and includes vessels omitted because of NMFS data confidentiality policies.

Table 35 shows that during the 1992-2000 period, IR/IU flatfish discards averaged 4.9 percent of retained groundfish, but in 2000, discards were less than 2 percent.

Table 35. IR/IU Flatfish Discards by Non-AFA Trawl Catcher Vessels ≥ 60 Feet, 1992-2000

	BSAI Pacific Cod Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	150	22	4,223	3.6	0.5	249	9,579	2.6	203	3,065	6.6
1993	311	39	2,684	11.6	1.5	173	7,572	2.3	931	4,468	20.8
1994	417	36	2,912	14.3	1.2	105	6,616	1.6	246	1,742	14.1
1995	424	8	2,656	16.0	0.3	205	9,608	2.1	239	1,509	15.8
1996	287	56	2,290	12.5	2.5	98	10,017	1.0	373	4,443	8.4
1997	549	28	3,447	15.9	0.8	259	11,486	2.3	254	2,531	10.0
1998	68	8	1,257	5.4	0.6	113	9,202	1.2	56	1,235	4.5
1999	227	3	1,461	15.5	0.2	95	11,328	0.8	39	753	5.2
2000	98	8	2,865	3.4	0.3	77	7,328	1.0	111	5,795	1.9

Source: Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

Trawl Catcher Vessels Less than 60 Feet in Length

This catcher vessel class includes all vessels for which trawl catch accounts for more than 15 percent of total catch value, vessel length is less than 60 ft. and the total value of groundfish catch is greater than $2,500.

The TCV < 60 fleet is treated as a distinct class because of differences between these vessels and larger trawling catcher vessels. In particular, vessels in the TCV < 60 class are allowed to participate in the State of Alaska commercial seine fisheries for salmon. Alaska's limited entry program for salmon fisheries established a 58-foot length limit for seine vessels entering these fisheries after 1976. Many trawl catcher vessels less than 60 feet in length were built to be salmon purse seine vessels, while others were designed to function as both trawlers and seiners.

Vessels in the TCV < 60 class are distinct from fixed gear vessels greater than 32 feet and less than 60 feet because of their ability and propensity to use trawl gear. Vessels in the TCV < 60 class have larger engines, more electronics, larger fish holds and the necessary deck gear and nets to operate in trawl fisheries. Similar-sized fixed gear vessels that participate in commercial salmon fisheries with seine gear have not made the necessary investment to participate in trawl fisheries.

Vessels in this class typically were constructed for use in the salmon purse seine fishery. These vessels have the cabin set forward, a relatively large working deck aft and the fish hold amidships. Vessels originally designed as purse seine vessels have booms and hydraulic winches that enable them to handle the nets and other trawl equipment. Most vessels in this class are constructed of steel or fiberglass, with steel the preferred material for larger vessels. Relatively few vessels are constructed of wood or aluminum.

Trawling equipment on these vessels is often mounted toward the aft part of the working deck because the fish hold is amidships or further forward. The trawl reel is mounted on the deck so that it can retrieve the trawl gear over the stern. Concerns about vessel stability typically prevent small trawl vessels from mounting the trawl reel forward near the cabin and above the deck as is often done on larger trawl catcher vessels. On those vessels not constructed with a stern ramp, the trawl is brought onboard over the side, as in a purse seine operation. Depending on the size of the harvest, the cod-end (that portion of the net that holds the catch) may be hauled onboard or towed by the vessel to an at-sea processor. At times, the cod end may be very heavy and cannot be brought onboard without creating an unsafe condition. In such circumstances, the crew may use a small net with a handle (brailer) to move part of the catch into the fish hold until the cod end is light enough to haul aboard.

In 2000, vessels in the TCV < 60 class had an average length of 57 feet and ranged from 41 to 58 feet. The vessels have an average horsepower rating of about 410, with a maximum of about 700 and a minimum of 160. Average gross tonnage is approximately 77 tons and average hold capacity is 1,900 cubic feet—45 percent less than vessels in the TCV Non-AFA class. In 1995, many owners in the class changed the way they reported their vessel's length to management agencies (from registered length to length overall). This reporting change explains the sudden change from lengths less than 50 feet to lengths greater than 50 feet in the class.

Table 36 shows the ex-vessel value of the catch of trawl catcher vessels less than 60 feet in length. Vessels in the class have had very little activity in the BSAI and have concentrated their effort in the GOA PCOD fishery, which generates roughly 65 percent of their total gross revenue.

Table 36. Ex-Vessel Value ($Millions) of Catch of Trawl Catcher Vessels Less than 60 Feet in Length by Species, 1992-2000

	BSAI				GOA				
Year	FLAT	ROCK	PCOD	PLCK	FLAT	ROCK	PCOD	PLCK	Total
1992	a	a	a	a	0.2	0.0	7.3	0.7	9.1
1993	a	a	a	a	0.2	0.0	5.0	0.9	7.3
1994	a	a	a	a	0.1	0.0	4.3	1.7	8.1
1995	a	a	0.0	a	0.3	0.0	4.4	1.5	7.6
1996	a	a	a	a	0.8	0.0	6.7	1.9	11.1
1997	a	a	0.0	0.1	0.5	0.0	7.8	3.7	13.8
1998	0.0	a	a	0.1	0.2	0.0	6.3	2.7	10.5
1999	a	a	0.0	0.1	0.1	0.0	9.2	2.7	13.2
2000	0.0	a	0.1	0.6	0.1	0.0	9.1	2.3	13.4

Source: CFEC Fish-ticket Data provided by the NPFMC, 2001.
a: Omitted because of NMFS data confidentiality policies.
Total column includes catches of other groundfish, including Atka mackerel and sablefish, and includes vessels omitted because of NMFS data confidentiality policies.

Table 37 shows that since 1998, discards of IR/IU flatfish have been relatively low as a percent of retained groundfish. In the GOA PCOD fishery, IR/IU flatfish discards have been less than 2 percent of retained groundfish every year since 1996. Discards in the shallow-water flatfish fishery were relatively high prior to 1997, but they have since declined significantly. It is important to note that these vessels are exempt from observer coverage, which may affect the reliability of discard estimates.

Table 37. IR/IU Flatfish Discards in Affected Fisheries of Non-AFA Trawl Catcher Vessels < 60 Feet, 1992-2000

	BSAI Pacific Cod CV Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	0	0	0	0.0	0.0	472	17,549	2.7	41	672	6.0
1993	0	0	0	0.0	0.0	296	13,799	2.1	209	1,035	20.2
1994	0	0	0	0.0	0.0	168	13,959	1.2	22	155	14.1
1995	0	0	0	0.0	0.0	186	9,526	2.0	59	375	15.8
1996	0	0	0	0.0	0.0	127	17,568	0.7	121	1,440	8.4
1997	0	0	0	0.0	0.0	263	19,008	1.4	105	1,050	10.0
1998	0	0	0	0.0	0.0	163	15,061	1.1	9	203	4.5
1999	0	0	0	0.0	0.0	96	12,465	0.8	5	87	5.2
2000	0	0	0	0.0	0.0	98	9,584	1.0	6	333	1.9

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

2.2.4 Summary of Impacts of Alternatives on the Affected Human Environment

The following summary of impacts of alternatives on the affected human environment is drawn from information in Section 2 as well as from information in the Regulatory Impact Review in Section 3 and the Initial Regulatory and Flexibility Analysis in Section 4.

Alternative 1, which represents a 100 percent retention, would lead to decreases in gross revenue for the affected fisheries and could yield substantial decreases in gross revenue associated with rock sole in the Pacific cod fishery. Assuming hold space is limited, the additional flatfish retained would displace fish of higher value, thereby decreasing per trip revenues. The problem of damaging non-flatfish, such as Pacific cod, by mixing rough-scaled flatfish and soft-fleshed roundfish in the hold may be a problem for many of the catcher vessels. This problem may be avoided if flatfish are segregated in a separate hold. However, most catcher vessels are unlikely to be able to dedicate an entire hold to the relatively small amount of flatfish that are likely to be taken. Furthermore, it is generally reported that many (perhaps most) of these catcher vessels do not have the capacity to sort their catch at sea, under any circumstance. Historical catches and discards of IR/IU flatfish by trawl catcher vessels are highest in the BSAI Pacific cod fishery, both in terms of volume and percent by weight of retained groundfish. During the 1992-2000 period, discards of RSOL and YSOL were 12.6 percent of the total amount of groundfish retained. In the same period, discards of SFLT in the GOA Pacific cod fishery were only 1.6 percent of total retained groundfish, while discards of SFLT in the SFLT target fishery were 9.8 percent of the total amount of groundfish retained. Over 75 percent of trawl catcher vessel gross revenue was generated from landings of pollock and 20 percent was generated in Pacific cod fisheries. Only 3 percent of trawl catcher vessel gross revenue was generated from landings of flatfish. Moreover, since 1998, flatfish have accounted for only 1 percent of total gross revenue. Clearly, pollock and Pacific cod are the mainstay of trawl catcher vessels, and because bottom trawling for pollock was prohibited in 1999, IR/IU flatfish regulation are likely to affect only those trawl catcher vessels that participate in Pacific cod fisheries. An exception to this generalization may be found among those vessels that participate in the relatively small SFLT fishery.

Alternative 2 would allow some discards of the IR/IU flatfish species. The percent retention requirement would be set independently for each species and would range from 50 percent to 90 percent. The analysis of the effects of alternative retention requirements on catcher vessels shows that virtually 100 percent of the catch of BSAI RSOL and BSAI YSOL is discarded in all the fisheries in which BSAI RSOL and BSAI YSOL are caught. Consequently, any retention requirement for BSAI RSOL or BSAI YSOL would be expected to result in adverse economic and operational impacts. Even a 100 percent retention requirement for these IR/IU flatfish species will have a minor economic impact on catcher vessels in terms of discards as a percent of the weight of groundfish retained in 2000. This measure can be interpreted as a displacement of revenue tonnage. A full retention requirement for BSAI RSOL would have the greatest effect, and this requirement would result in less than a five percent displacement in revenue tonnage for all catcher vessel classes. The economic effect of any GOA SFLT retention requirement on catcher vessels is also likely negligible.

Alternative 3 would delay implementation of IR/IU flatfish rules for up to 3 years. Delaying implementation will postpone the severe economic consequences discussed under Alternative 1 and will allow the benefits of the economic activity associated with the operation of these vessels to accrue to vessel operators for the period of the delay. A delay in implementation could also provide time for assessment of the potential for rationalization within the IR/IU flatfish fisheries. These fisheries are characterized by a "race for fish" mode of operation that exacerbates the economic impacts of the IR/IU rules. Rationalization may ease some aspects of the "race for fish", but may not eliminate all aspects because IR/IU flatfish are targeted during specific roe seasons and times of highest quality. However, possibilities for fleet consolidation or cooperative operations that might ease the economic burden of IR/IU flatfish rules could be explored during a delay in implementation. In the past several years,

discards of GOA shallow-water flatfish and BSAI yellowfin sole have been trending downward. Industry sources indicate that they have been doing all that they can to utilize all the IR/IU flatfish that they harvest and are actively attempting to develop markets for smaller fish.

Alternative 4 exempts fisheries from IR/IU flatfish regulations if flatfish discards are less than 5 percent of total groundfish catch. This analysis used two different estimates of the discard rates for determination of the IR/IU exemption—one estimate is based on a weighted average discard rate for 1995-2001, and a second estimate is based on a weighted average discard rate for 1999-2001. Discards exceed 5 percent (shaded cells in the right-most column) in most flatfish fisheries and in Pacific cod trawl fisheries in the BSAI, but in the GOA, only in the very small Western Gulf Shallow-water flatfish fishery. The revenue reductions of this alternative are similar to those of Alternative 1. The main difference between the two alternatives is that the operations of catcher vessels in GOA fisheries would likely be unaffected under Alternative 4.

The preferred alternative would implement IR/IU flatfish regulations in the GOA fisheries, beginning in 2003, and delay implementation of IR/IU flatfish regulations in the BSAI fisheries, through June 2004. The economic impact of the preferred alternative on individual vessels is expected to be minimal. As discussed above in Alternative 1, discards of shallow water flatfish in the GOA Pacific cod fishery were only 1.6 percent of total retained groundfish representing an approximate 1.6 percent reduction in gross revenue of the target Pacific cod. Although not directly impacting vessels, the analysts point out that in addition to the immediate effects of implementation in the GOA, it is expected that the additional 18 months before implementation in the BSAI will provide industry, and the managing agencies, time to develop measures that can meet bycatch reduction needs, while allowing the industry to continue to operate effectively.

Environmental impacts of the alternatives, including the Preferred Alternative, are expected to be insignificant based on the information and assessments contained in Chapter 2. In terms of potential cumulative impacts, the proposed action would not result in any changes to the fisheries relative to the way they are currently prosecuted. In essence, the basic action would simply postpone implementation of pending regulations which likely would have resulted in changes in the way the fisheries are prosecuted. By definition, therefore, cumulative impacts of the proposed action are non-existent.

3.0 Regulatory Impact Review

Section 3.0 provides information regarding the economic and socioeconomic impacts of the proposed action and alternatives, including identification of the individuals or groups that may be affected by the action, the nature of these impacts, quantification of the economic impacts, if possible, and discussion of the trade-offs between qualitative and quantitative benefits and costs.

A Regulatory Impact Review (RIR) provides the analysis required under E.O. 12866. The following statement from the Executive Order summarizes these requirements:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.*

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant". A "significant regulatory action" is one that is likely to:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

The primary source of information for this assessment of the effects of the alternatives on the human environment is the document, *Assessment of Changes in IR/IU Flatfish Requirements*, prepared for the NPFMC by Northern Economics, Inc. (2002).

3.1 Purpose and Need for Action

In 1997 and 1998 the NPFMC approved amendments implementing IR/IU regulations for pollock and Pacific cod in the BSAI and GOA. These amendments included similar regulations for flatfish species, with implementation specifically delayed until January 1, 2003 in order to provide the industry an opportunity to develop fishing methods and strategies to more effectively avoid catching unwanted flatfish and/or develop new products and markets for the harvested flatfish that were being discarded. Without such a delay the Council determined that this sector would suffer significant adverse economic impacts. However, the full extent to which the IR/IU rules would affect the different sectors of the groundfish fleet that participate in these fisheries had not been determined.

In an effort to balance the need to meet stated NPFMC objectives of ensuring healthy fisheries, reducing discards and waste, and improving utilization of fish resources with the need to minimize the negative effects of regulations on small entities, the NPFMC has recognized the need to conduct additional assessment of the impacts of IR/IU rules for flatfish on such entities and to determine whether a modification of these would minimize such impacts and continue to meet the NPFMC's objectives for fisheries health and resource utilization.

The potential impact of IR/IU rules for flatfish on some sectors of the groundfish fisheries of the BSAI and GOA creates the possibility that some entities currently participating in these fisheries might be compelled to discontinue their participation due to the economic burden the rules could place on their operation. At its June 2002 meeting, the NPFMC developed a problem statement specifically to address the pending implementation of IR/IU regulations for the flatfish fisheries, as follows:

> "100 percent retention of rock sole and yellowfin sole (as currently scheduled) results in severe economic losses to certain participants in the fishery, while less than 100 percent retention of only these species is not enforceable".

Therefore, the Council developed this assessment of alternatives to full retention of flatfish.

3.2 Description of the Fishery

A detailed description of the potentially affected fisheries is provided in Section 2.2.3—it is summarized below.

The total number of processors participating in all BSAI and GOA groundfish fisheries has decreased from 216 in 1992 to 161 in 2000. Among the IR/IU flatfish species, the YSOL target fishery has had the highest participation, except in 1993 when the RSOL target fishery had the highest participation level. The target fisheries for the IR/IU flatfish show similar decreasing trends in total participation since the mid-1990s. Participation in the RSOL target fishery declined from 39 in 1995 to 21 in 1998. During this same period, participation in the YSOL target fishery decreased from 50 to 26. Participation in the GOA shallow-water flatfish fishery decreased from 18 in 1995 to a period low of 8 in 1999. (See Table 9 in Section 2.2.3).

In total, wholesale value of the BSAI and GOA groundfish fisheries were worth over $1.4 billion in 1992, but have had fluctuations in total value since then. In 2000, the total wholesale value of these fisheries was just under $1.4 billion. The wholesale value of PLCK is the largest component of total wholesale value in every year and is generally between two to four times larger than the PCOD value, which is the next highest value species. Sablefish is the third largest species in terms of wholesale value.

The wholesale values of IR/IU flatfish have historically been considerably smaller than those of PLCK, PCOD or SABL.

The wholesale value of SFLT has fluctuated, with a high of $10.24 million in 1996. In 1999, the value was $1.82 million, but it rose to $7.68 million by 2000. BSAI rock sole also has fluctuated in value and generally trended downward in the late 1990s. The wholesale value for RSOL was $15.83 million in 2000, which is less than half the high value of $43.66 million recorded in 1994. Among the IR/IU species of concern, BSAI yellowfin sole has historically had the greatest wholesale value. However, the wholesale value of YSOL fell to a low of $19.77 million in 1999, compared with the high of $68.32 million in 1997. In 2000, the total value increased to $24.67 million.

The IR/IU flatfish have historically accounted for a small share of the total value of the BSAI and GOA groundfish fisheries. The GOA SFLT complex has contributed less than 1 percent of the total value in every year from 1992-2000. The contribution of BSAI rock sole has not exceeded 3 percent over that period and dropped to 1.1 percent in 2000. The contribution of YSOL has fluctuated over the years with a high of 5.7 percent in 1997 and a low of 1.6 percent in 1999. Though their contribution is small in percentage terms, these fisheries have had a combined wholesale value of as much as $100 million in the early 1990s. However, these values have fallen in recent years. In 2000, the combined wholesale value of IR/IU flatfish was $48.18 million (see Table 10 in Section 2.2.3). These data are treated in more detail, by fishery, in Section 2.2.3 (see Table 11).

3.2.1 Catch and Bycatch (Discards) of Rock Sole

The total catch of RSOL peaked in 1997 at 67,810 metric tons but fell to less than half that value in 1998 when 33,660 metric tons were caught. By 2000, total catch had increased to 49,670 metric tons. The target fishery for RSOL is generally the largest single contributor to the total catch of RSOL. However, this contribution is not always a majority share. In recent years, significant catch of RSOL also occurred in the target fisheries for YSOL, PCOD and OFLT. These data suggests that the imposition of IR/IU rules for BSAI rock sole will likely affect the target fishery for RSOL and could also affect the target fisheries for YSOL, PCOD and OFLT. The data also suggest that participants in the target fisheries for ROCK and SABL will not likely be affected by IR/IU rules because these target fisheries have recorded less than 10 metric tons of catch of RSOL in 2000, and in most years from 1992-2000 (see Table 12 in Section 2.2.3).

Total discards of RSOL have ranged from as high as 41,660 metric tons (1993) to as low as 21,000 (1998) and were 27,330 metric tons in 2000. Most of these discards occur in the target fisheries for RSOL, YSOL, PCOD and PLCK, and some discards occur in the OFLT target fishery (see Table 13 in Section 2.2.3). As seen in Figure 1 of Section 2.2.3, the HT-CP sector accounts for the vast majority of RSOL catch and discard. As a result this sector will stands to gain the most from the preferred alternative and will incur the greatest adverse effects from retention of the status quo.

3.2.2 Catch and Bycatch (Discards) of Yellowfin Sole

Total catch of YSOL during the period has varied considerably. In 1997, harvests peaked at 182,810 metric tons but declined significantly over the next two years and were 84,070 metric tons in 2000. This decline in total harvest since the mid-1990s is generally consistent with declines in processor participation in the YSOL target fishery. Percent of YSOL catch in each target shows that nearly all YSOL is harvested in the target fishery for YSOL. Relatively small amounts are also harvested in the target fisheries for OFLT, RSOL, PCOD and PLCK. These data suggest that IR/IU rules are likely to have the greatest effect on participants in the YSOL target fishery. However, some effects may also accrue to participants in the target fisheries for OFLT, RSOL, PCOD and PLCK. The data also suggest that participants in the target fisheries for AMCK, OTHR, ROCK and SABL will not likely be affected by IR/IU rules because these target fisheries have recorded less than ten metric tons of catch of YSOL in 2000, and in most years from 1992-2000. The extent to which the rules will affect the various target fisheries will depend on the rate of discard of YSOL in each target fishery (see Table 18 in Section 2.2.3).

Table 15 in Section 2.2.3 shows the historic discards of YSOL in target fisheries of all processors from 1992 to 2000. Total discards of YSOL have ranged from as high as 42,830 metric tons (1992) to as low as 12,470 (1999) and were 14,100 metric tons in 2000. Most of these discards occur in the YSOL target fishery. However, the discard rate in the YSOL target fishery is relatively low when compared to the other target fisheries and was at its lowest in 2000, at 13.4 percent. Lesser amounts of yellowfin sole discards also occur in the RSOL, OFLT, PCOD and PLCK target fisheries. Discard rates for the RSOL and OFLT target fisheries are moderate relative to that of the YSOL target fishery, but some participants in these target fisheries may be affected by IR/IU flatfish rules. The target fisheries for AMCK, OTHR, ROCK and SABL have little or no share in total discards of YSOL. However, discard rates in some of these targets tend to be high, if not 100 percent, in years when they have measurable (10 metric tons or greater) discard amounts. It is possible that some participants in these target fisheries would be adversely affected by IR/IU rules because of required use of hold space for YSOL that would otherwise be discarded. The extent of these effects will depend on what proportion of hold space must be used to meet the IR/IU rules, what species catch (composition) is displaced, and the respective economic value associated with each.

As seen in Figure 3 of Section 2.2.3, the HT-CP have historically discarded the largest share of total discards and their relative share has been increasing in recent years. However, a general downward trend

in total discards of YSOL is evident for all sectors. Relatively, the HT-CP sector stands to gain the most from the preferred alternative and will incur the greatest adverse effects from retention of the status quo.

3.2.3 Catch and Bycatch (Discards) of Shallow-water Flatfish

The catch of SFLT has fluctuated considerably during the 1992-2000 period. The largest catch was recorded in 1993, at 9,650 metric tons. Total catch of this species complex declined by more than half in 1994, but increased to 9,370 metric tons in 1996. From 1996 to 1999, the catch declined to a period low of 2,540 metric tons. This low corresponds with the period low in participation in the SFLT target fishery. In 2000, the 1999 low value more than doubled to 6,930 metric tons of total catch.

The "percent of catch" data show that the target fishery for SFLT contributes the largest share of total catch of SFLT. However, that contribution is not always a majority share. In some years, significant catch has also occurred in the target fisheries for PCOD, OFLT, PLCK and ROCK. Thus, the effects of IR/IU rules for GOA shallow-water flatfish may accrue to some participants in these target fisheries. Small but measurable harvests of SFLT also occur in some years in the OTHR and SABL target fisheries (see Table 20 in Section 2.2.3).

Total discards of SFLT have ranged from as high as 3,400 metric tons (1993) to as low as 550 metric tons (1999) and were 780 metric tons in 2000. Most of these discards occur in the target fisheries for SFLT, PCOD, OFLT, PLCK and ROCK. The target fisheries for OTHR and SABL have little or no share in total discards of SFLT. The data on discards as a percent of SFLT catch show that the highest rates of discard generally occur in the PCOD, PLCK, SABL and ROCK fisheries. Comparing the rates of discard as a percent of catch with the percent of catch for the target fishery shows that IR/IU retention rules for SFLT would not likely have a large impact on participants in the OTHR target fishery. This is also true for target fisheries for AMCK and SABL. The target fisheries that have the largest shares of discards of SFLT are likely to be most affected by IR/IU flatfish retention rules. These include target fisheries for SFLT, PCOD, OFLT, PLCK and ROCK.

Historically, Kodiak shore plants have had the largest share of total discards of SFLT, however, their share has been decreasing since 1997 and the share for head and gut trawl catcher processors has increased since 1999. Figure 5, in Section 2.2.1, graphically depicts these trends. Of note is the scale of this graph as compared to those, also found in Section 2.2.1, for RSOL and YSOL. Discards of SFLT have been less than 1,000 metric tons in the past several years as compared to RSOL discards of over 25,000 metric tons and YSOL discards nearing 15,000 metric tons.

The interested reader will find additional detail on the current condition of processing sectors in the affected fisheries in Section 2.2.1.

3.2.4 Processing Sector Analysis of Discards as a Percent of Product

The preceding analysis showed that several processing sectors are not pertinent in an assessment of the economic and social impacts of IR/IU flatfish rules, due to their low level of IR/IU flatfish catches and discards. In particular, the analysis of catch and discards related to the IR/IU flatfish revealed that the economic effects of IR/IU flatfish rules will be negligible for Southeast shore plants and motherships. This section further refines the analysis by examining the amount of discards as a percent of product tons (DPP) by sector and target fishery. If vessel hold space is a limiting factor, the DPP represents the percentage of revenue tonnage that would be displaced if full retention of IR/IU flatfish is required.

The DPP tables that follow separate target fisheries by geographic area (BSAI or GOA). The top portion of each table presents the product amount in thousands of metric tons, by target fishery and year, for the sector. The lower portion of the table presents the annual DPP values for the sector in each target fishery. The sectors and target fisheries that had a DPP equal to or greater than 5 percent in 1999, and/or 2000, are the focus of the economic impact analysis presented in Section 3 of this document.

3.2.4.1 Surimi and Fillet Trawl Catcher Processors

Table 38 presents discards of RSOL as a percent of product tons in target fisheries of surimi and fillet trawl catcher processors, from 1992-2000. In 1999 and 2000, only the BSAI Pacific cod (BSAI PCOD) and RSOL target fisheries generated RSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that surimi and fillet trawl catcher processors participating in the BSAI PCOD and RSOL target fisheries may experience significant economic impacts from IR/IU rules for RSOL.

Table 38. Discards of Bering Sea Rock Sole as a Percent of Product Tons in Target Fisheries of Surimi and Fillet-Trawl Catcher Processors, 1992-2000

	BSAI					GOA	All
	OFLT	PCOD	PLCK	RSOL	YSOL	Fisheries	Fisheries
Year	Product Tons (Thousands of Metric Tons)						
1992	0.55	7.81	141.93	2.68	20.81	2.03	175.80
1993	0.63	5.85	137.60	4.55	16.69	1.17	166.49
1994	0.34	3.67	145.42	3.82	20.68	0.72	174.65
1995	0.32	4.79	144.02	0.88	21.79	1.17	172.98
1996	0.01	3.92	134.40	0.44	24.96	1.63	165.36
1997	1.20	5.25	117.10	1.42	21.73	0.87	147.58
1998	0.14	3.89	124.14	0.18	10.98	0.21	139.54
1999	0.00	2.20	104.39	0.00	6.53	0.00	113.12
2000	0.00	0.97	127.59	0.38	4.14	0.00	133.07
Year	Discards of Bering Sea Rock Sole as a Percent of Product Tons						
1992	37.17	17.36	3.55	139.61	18.38	n/a	8.06
1993	12.23	29.07	2.87	179.93	8.96	n/a	9.25
1994	a	33.09	1.11	143.51	7.09	n/a	5.61
1995	36.32	44.81	0.96	109.58	5.84	n/a	3.40
1996	a	23.69	1.03	102.50	8.18	n/a	2.91
1997	a	14.11	1.03	128.97	9.29	n/a	3.93
1998	a	14.67	0.19	327.65	9.70	n/a	1.94
1999	0.00	17.92	0.39	0.00	1.61	n/a	0.80
2000	a	14.70	1.27	15.03	0.44	n/a	1.38

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 39 presents discards of YSOL as a percent of product tons in target fisheries of surimi trawl catcher processors from 1992-2000. In 1999 and 2000, only the YSOL target fishery generated YSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that surimi and fillet trawl catcher processors participating in the YSOL target fishery may experience significant economic impact from IR/IU rules for YSOL.

Table 39. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Surimi and Fillet-Trawl Catcher Processors, 1992-2000

	BSAI					GOA	All
	OFLT	PCOD	PLCK	RSOL	YSOL	Fisheries	Fisheries
Year	**Product Tons (Thousands of Metric Tons)**						
1992	0.55	7.81	141.93	2.68	20.81	2.03	175.80
1993	0.63	5.85	137.60	4.55	16.69	1.17	166.49
1994	0.34	3.67	145.42	3.82	20.68	0.72	174.65
1995	0.32	4.79	144.02	0.88	21.79	1.17	172.98
1996	0.01	3.92	134.40	0.44	24.96	1.63	165.36
1997	1.20	5.25	117.10	1.42	21.73	0.87	147.58
1998	0.14	3.89	124.14	0.18	10.98	0.21	139.54
1999	0.00	2.20	104.39	0.00	6.53	0.00	113.12
2000	0.00	0.97	127.59	0.38	4.14	0.00	133.07
Year	**Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons**						
1992	28.50	1.31	0.46	28.55	52.95	n/a	7.22
1993	16.48	4.82	0.65	12.75	36.59	n/a	4.78
1994	a	11.00	0.33	13.25	47.84	n/a	6.46
1995	70.66	0.45	0.36	9.44	24.47	n/a	3.57
1996	a	1.67	1.06	2.21	30.01	n/a	5.50
1997	a	0.41	0.51	35.28	43.25	n/a	7.20
1998	a	0.50	0.85	16.63	19.02	n/a	2.33
1999	0.00	0.01	0.06	0.00	12.30	n/a	0.77
2000	a	0.20	0.52	0.15	1.72	n/a	0.56

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

The analysis of catch and discards by sector presented previously found that surimi and fillet trawl catcher processors have had little or no measurable catch or discards of SFLT in recent years. Therefore, an analysis of SFLT discards as a percent of product tons was not performed for this sector.

3.2.4.2 Head and Gut Trawl Catcher Processors

Table 40 presents discards of RSOL as a percent of product tons in target fisheries of head and gut trawl catcher processors from 1992-2000. In the 1999 and 2000 evaluation period, the OFLT, BSAI PCOD, PLCK, RSOL and YSOL target fisheries all generated RSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that participants in this sector may experience significant economic impacts from IR/IU rules for RSOL in all of those target fisheries.

Table 40. Discards of Bering Sea Rock Sole as a Percent of Product Tons in Target Fisheries of Head and Gut Trawl Catcher Processors, 1992-2000

	BSAI Fisheries					All GOA	All
	OFLT	PCOD	PLCK	RSOL	YSOL	Fisheries	Fisheries
Year	Product Tons (Thousands of Metric Tons)						
1992	2.21	4.33	3.34	9.89	35.58	3.95	59.31
1993	4.31	3.56	4.89	13.71	31.35	4.98	62.79
1994	6.34	2.50	1.95	12.14	40.47	5.14	68.54
1995	8.77	5.36	2.61	13.15	35.27	4.59	69.76
1996	8.47	3.82	3.10	11.34	28.58	8.92	64.22
1997	7.03	6.36	1.56	16.25	65.80	4.01	101.01
1998	14.40	4.47	1.77	8.68	49.07	5.48	83.86
1999	12.04	9.64	1.34	8.68	29.14	5.30	66.13
2000	15.79	9.45	1.15	12.09	37.04	9.25	84.76
Year	Discards of Bering Sea Rock Sole as a Percent of Product Tons						
1992	19.21	11.39	6.12	78.49	16.56	n/a	24.92
1993	22.71	15.52	10.50	110.01	9.45	n/a	31.99
1994	4.83	39.53	42.36	146.37	9.96	n/a	34.91
1995	13.06	65.61	10.35	92.64	10.01	n/a	29.60
1996	21.49	49.99	0.70	57.21	21.11	n/a	25.34
1997	21.52	71.72	6.01	73.08	13.49	n/a	26.65
1998	18.30	44.77	11.24	55.76	12.45	n/a	18.82
1999	16.62	36.36	12.92	85.37	23.63	n/a	30.20
2000	9.04	40.94	1.22	119.39	10.25	n/a	27.77

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 41 presents discards of YSOL as a percent of product tons in target fisheries of head and gut trawl catcher processors from 1992-2000. In 1999 and 2000, the OFLT, BSAI PCOD, RSOL and YSOL target fisheries generated YSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that participants in this sector may experience significant economic impacts from IR/IU rules for YSOL in all of those target fisheries.

Table 41. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Head and Gut Catcher Processors, 1992-2000

	BSAI Fisheries					All GOA	All
	OFLT	PCOD	PLCK	RSOL	YSOL	Fisheries	Fisheries
Year	Product Tons (Thousands of Metric Tons)						
1992	2.21	4.33	3.34	9.89	35.58	3.95	59.31
1993	4.31	3.56	4.89	13.71	31.35	4.98	62.79
1994	6.34	2.50	1.95	12.14	40.47	5.14	68.54
1995	8.77	5.36	2.61	13.15	35.27	4.59	69.76
1996	8.47	3.82	3.10	11.34	28.58	8.92	64.22
1997	7.03	6.36	1.56	16.25	65.80	4.01	101.01
1998	14.40	4.47	1.77	8.68	49.07	5.48	83.86
1999	12.04	9.64	1.34	8.68	29.14	5.30	66.13
2000	15.79	9.45	1.15	12.09	37.04	9.25	84.76
Year	**Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons**						
1992	19.56	0.62	1.69	19.86	68.12	n/a	45.05
1993	51.05	3.54	0.23	23.48	47.70	n/a	32.66
1994	17.73	22.93	17.39	25.48	43.47	n/a	33.15
1995	36.22	3.90	1.14	13.50	44.00	n/a	29.69
1996	31.42	7.65	1.93	20.62	43.10	n/a	27.51
1997	13.22	4.95	0.10	12.68	26.37	n/a	20.45
1998	22.87	6.23	10.71	11.18	24.91	n/a	20.21
1999	15.35	3.17	1.74	9.85	27.99	n/a	16.92
2000	10.60	8.61	1.30	5.68	25.73	n/a	15.00

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 42 presents discards of SFLT as a percent of product tons in target fisheries of head and gut trawl catcher processors from 1992-2000. In 1999 and 2000, the GOA Pacific cod target fishery, and possibly the SFLT target fishery, generated SFLT discards greater or equal to 5 percent of total product tons for this sector. The amount of discards in the SFLT target fishery for these two years must be approximated using earlier data due to the limited participation by the HT-CP sector in this fishery in recent years. These data suggest that participants in this sector may experience significant economic impacts from IR/IU rules for SFLT in those target fisheries.

Table 42. Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons in Target Fisheries of Head and Gut Catcher Processors, 1992-2000

	GOA Fisheries				All BSAI Fisheries	All Fisheries
	OFLT	PCOD	PLCK	SFLT		
Year	Product Tons (Thousands of Metric Tons)					
1992	2.13	1.36	0.11	0.35	55.35	59.31
1993	4.32	0.24	0.00	0.42	57.82	62.79
1994	3.85	1.25	0.00	0.04	63.40	68.54
1995	3.43	0.97	0.00	0.19	65.16	69.76
1996	7.84	0.31	0.00	0.77	55.31	64.22
1997	3.17	0.61	0.00	0.23	97.00	101.01
1998	3.54	1.86	0.00	0.08	78.39	83.86
1999	4.33	0.95	0.00	0.02	60.84	66.13
2000	8.22	1.02	0.01	0.00	75.52	84.76
Year	Discards of SFLT as a Percent of Product Tons					
1992	0.64	16.48	10.60	22.28	n/a	0.55
1993	0.57	16.77	a	50.36	n/a	0.44
1994	1.72	3.00	0.00	a	n/a	0.15
1995	1.63	1.78	19.29	33.77	n/a	0.20
1996	0.92	0.99	0.00	16.08	n/a	0.31
1997	1.53	3.11	0.00	32.49	n/a	0.14
1998	1.01	1.52	a	3.28	n/a	0.08
1999	0.23	4.95	0.00	a	n/a	0.10
2000	1.20	24.05	a	a	n/a	0.41

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

3.2.4.3 Pot Catcher Processors

The analysis of catch and discards by sector presented previously found that pot catcher processors have had little or no measurable catch or discards of RSOL or SFLT in recent years. Therefore, an analysis of RSOL or SFLT discards as a percent of product tons was not performed for this sector.

Table 43 presents discards of YSOL as a percent of product tons in target fisheries of pot catcher processors from 1992-2000. In 1999 and 2000, none of the target fisheries in this sector generated discards of YSOL greater or equal to 5 percent of total product tons. These data suggest that participants in this sector will not experience significant economic impacts from IR/IU rules for YSOL.

Table 43. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Pot Catcher processors, 1992-2000

	BSAI Pacific Cod	All GOA Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)		
1992	3.74	0.04	3.78
1993	0.29	0.00	0.29
1994	0.75	0.00	0.75
1995	2.16	0.05	2.21
1996	3.74	0.00	3.74
1997	2.19	0.00	2.19
1998	1.47	0.01	1.49
1999	1.64	1.93	3.57
2000	1.35	0.46	1.81
Year	Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons		
1992	0.12	n/a	0.12
1993	a	n/a	a
1994	0.02	n/a	0.02
1995	0.37	n/a	0.36
1996	1.75	n/a	1.75
1997	1.41	n/a	1.41
1998	4.76	n/a	4.71
1999	1.80	n/a	0.83
2000	4.25	n/a	3.17

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

3.2.4.4 Longline Catcher Processors

Table 44 and Table 45 present discards of RSOL and YSOL as a percent of product tons in target fisheries of longline catcher processors from 1992-2000. In 1999 and 2000, none of the target fisheries generated RSOL or YSOL discards greater than or equal to 5 percent of total product tons for this sector. These data suggest that participants in this sector will not experience significant economic impacts from IR/IU rules for these flatfish species.

Table 44. Discards of Bering Sea Rock Sole as a Percent of Product Tons in Target Fisheries of Longline Catcher processors, 1992-2000

	BSAI OFLT	BSAI PCOD	All GOA Fisheries	All Fisheries
Year	**Product Tons (Thousands of Metric Tons)**			
1992	0.05	44.97	4.16	49.18
1993	3.39	26.39	2.29	32.06
1994	0.42	37.69	1.82	39.98
1995	1.20	44.82	2.69	48.81
1996	1.76	43.27	2.38	47.41
1997	2.19	55.95	1.79	59.93
1998	3.54	45.06	1.52	50.12
1999	1.93	42.17	2.69	46.80
2000	2.39	45.42	2.35	50.16
Year	**Discards of Bering Sea Rock Sole as a Percent of Product Tons**			
1992	0.00	0.05	n/a	0.05
1993	0.00	0.07	n/a	0.05
1994	0.01	0.06	n/a	0.06
1995	0.06	0.09	n/a	0.08
1996	0.00	0.13	n/a	0.12
1997	0.00	0.07	n/a	0.07
1998	0.01	0.08	n/a	0.08
1999	1.62	0.06	n/a	0.12
2000	0.00	0.07	n/a	0.07

Source: NPFMC Sector Profiles Database, 2001
a: Number cannot be released because of NMFS data confidentiality policies
Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

Table 45. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Longline Catcher processors, 1992-2000

	BSAI OFLT	BSAI PCOD	All GOA Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	0.05	44.97	4.16	49.18
1993	3.39	26.39	2.29	32.06
1994	0.42	37.69	1.82	39.98
1995	1.20	44.82	2.69	48.81
1996	1.76	43.27	2.38	47.41
1997	2.19	55.95	1.79	59.93
1998	3.54	45.06	1.52	50.12
1999	1.93	42.17	2.69	46.80
2000	2.39	45.42	2.35	50.16
Year	Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons			
1992	0.00	0.12	n/a	0.11
1993	0.00	0.02	n/a	0.01
1994	0.00	0.40	n/a	0.38
1995	0.00	0.14	n/a	0.12
1996	0.00	0.42	n/a	0.38
1997	0.00	0.35	n/a	0.33
1998	0.00	0.57	n/a	0.51
1999	0.00	0.43	n/a	0.39
2000	0.00	0.62	n/a	0.56

Source: NPFMC Sector Profiles Database, 2001
a: Number cannot be released because of NMFS data confidentiality policies
Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

The analysis of catch and discards by sector presented previously found that longline catcher processors have had little or no measurable catch or discards of SFLT in recent years. Therefore, an analysis of SFLT discards as a percent of product tons was not performed for this sector.

3.2.4.5 Bering Sea Pollock Shore Plants

Table 46 presents discards of RSOL as a percent of product tons in target fisheries of Bering Sea pollock shore plants from 1992-2000. In 1999 and 2000, only the BSAI PCOD target fishery generated RSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that Bering Sea pollock shore plants participating in the BSAI PCOD target fishery may experience significant economic impacts from IR/IU rules for RSOL.

Table 46. Discards of Bering Sea Rock Sole as a Percent of Product Tons in Target Fisheries of Bering Sea Pollock Shore Plants, 1992-2000

	BSAI Fisheries				All GOA Fisheries	All Fisheries
	OFLT	PCOD	PLCK	YSOL		
Year	Product Tons (Thousands of Metric Tons)					
1992	0.00	7.25	124.12	1.45	7.31	140.18
1993	0.36	7.27	124.02	0.00	5.37	137.03
1994	0.45	14.35	138.41	3.91	2.99	160.11
1995	0.63	19.25	135.44	5.73	6.49	167.54
1996	0.09	22.57	132.84	4.02	0.57	160.09
1997	0.07	18.01	123.50	8.19	4.82	154.68
1998	0.28	15.01	125.17	0.02	3.51	143.99
1999	0.06	14.35	148.66	0.36	1.08	164.51
2000	0.02	14.57	181.73	0.38	2.57	199.29
Year	Discards of Bering Sea Rock Sole as a Percent of Product Tons					
1992	a	8.04	0.10	0.20	n/a	0.54
1993	0.00	31.15	2.33	0.00	n/a	3.76
1994	0.01	31.08	0.00	0.47	n/a	2.80
1995	0.00	27.16	0.03	a	n/a	3.15
1996	0.00	22.07	0.06	a	n/a	3.17
1997	0.00	29.01	0.06	a	n/a	3.49
1998	a	15.07	0.00	a	n/a	1.58
1999	a	27.77	0.04	a	n/a	2.46
2000	a	8.63	0.05	a	n/a	0.67

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 47 presents discards of YSOL as a percent of product tons in target fisheries of Bering Sea pollock shore plants from 1992-2000. In 1999 and 2000, none of the target fisheries generated YSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that participants in this sector will not experience significant economic impacts from IR/IU rules for YSOL.

Table 47. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Bering Sea Pollock Shore Plants, 1992-2000

	BSAI Fisheries				All GOA Fisheries	All Fisheries
	OFLT	PCOD	PLCK	YSOL		
Year	Product Tons (Thousands of Metric Tons)					
1992	0.00	7.25	124.12	1.45	7.31	140.18
1993	0.36	7.27	124.02	0.00	5.37	137.03
1994	0.45	14.35	138.41	3.91	2.99	160.11
1995	0.63	19.25	135.44	5.73	6.49	167.54
1996	0.09	22.57	132.84	4.02	0.57	160.09
1997	0.07	18.01	123.50	8.19	4.82	154.68
1998	0.28	15.01	125.17	0.02	3.51	143.99
1999	0.06	14.35	148.66	0.36	1.08	164.51
2000	0.02	14.57	181.73	0.38	2.57	199.29
Year	Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons					
1992	a	0.93	0.00	5.73	n/a	0.11
1993	0.00	4.94	0.02	0.00	n/a	0.28
1994	0.01	2.82	0.00	3.23	n/a	0.33
1995	0.03	0.77	0.00	a	n/a	0.12
1996	0.00	4.25	0.00	a	n/a	0.63
1997	0.00	1.54	0.00	a	n/a	0.30
1998	a	1.25	0.01	a	n/a	0.14
1999	a	0.44	0.00	a	n/a	0.06
2000	a	0.90	0.02	a	n/a	0.09

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

The analysis of catch and discards by sector presented previously found that Bering Sea pollock shore plants have had little or no measurable catch or discards of SFLT in recent years. Therefore, an analysis of SFLT discards as a percent of product tons was not performed for this sector.

3.2.4.6 Alaska Peninsula–Aleutian Islands Shore Plants

Table 48 presents discards of RSOL as a percent of product tons in target fisheries of Alaska Peninsula-Aleutian Islands shore plants from 1992-2000. In 1999 and 2000, only the BSAI PCOD target fishery generated RSOL discards greater or equal to 5 percent of total product tons for this sector. These data suggest that Alaska Peninsula-Aleutian Islands shore plants participating in the BSAI PCOD target fishery may experience significant economic impacts from IR/IU rules for RSOL.

Table 48. Discards of Bering Sea Rock Sole as a Percent of Product Tons in Target Fisheries of Alaska Peninsula-Aleutian Islands Shore Plants, 1992-2000

	BSAI PCOD	BSAI PLCK	All GOA Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	0.64	1.92	8.99	11.55
1993	2.81	3.24	8.89	15.09
1994	1.20	2.88	8.03	12.29
1995	1.64	5.98	6.74	14.43
1996	2.51	3.56	10.54	16.65
1997	1.86	3.29	15.51	20.66
1998	1.02	2.10	17.26	20.40
1999	2.77	4.73	17.49	25.00
2000	2.85	2.70	11.26	16.85
Year	Discards of Bering Sea Rock Sole as a Percent of Product Tons			
1992	8.51	a	n/a	0.47
1993	19.70	a	n/a	3.66
1994	33.17	a	n/a	3.25
1995	14.95	a	n/a	1.70
1996	12.93	a	n/a	1.97
1997	22.03	a	n/a	1.98
1998	8.17	a	n/a	0.41
1999	13.36	a	n/a	1.49
2000	4.76	a	n/a	0.82

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 49 and Table 50 present discards of YSOL and SFLT as a percent of product tons in target fisheries of Alaska Peninsula-Aleutian Islands shore plants from 1992-2000. In 1999 and 2000, none of the target fisheries generated YSOL or SFLT discards greater or equal to 5 percent of total product tons for this sector. These data suggest that participants in this sector will not experience significant economic impact from IR/IU rules for YSOL and SFLT.

Table 49. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Alaska Peninsula-Aleutian Islands Shore Plants, 1992-2000

	BSAI PCOD	BSAI PLCK	All GOA Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	0.64	1.92	8.99	11.55
1993	2.81	3.24	8.89	15.09
1994	1.20	2.88	8.03	12.29
1995	1.64	5.98	6.74	14.43
1996	2.51	3.56	10.54	16.65
1997	1.86	3.29	15.51	20.66
1998	1.02	2.10	17.26	20.40
1999	2.77	4.73	17.49	25.00
2000	2.85	2.70	11.26	16.85
Year	Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons			
1992	0.14	a	n/a	0.01
1993	1.75	a	n/a	0.33
1994	2.88	a	n/a	0.29
1995	1.18	a	n/a	0.14
1996	5.07	a	n/a	0.76
1997	1.63	a	n/a	0.15
1998	1.22	a	n/a	0.06
1999	0.83	a	n/a	0.09
2000	0.37	a	n/a	0.07

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 50. Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons in Target Fisheries of Alaska Peninsula-Aleutian Islands Shore Plants, 1992-2000

	GOA PCOD	GOA PLCK	All BSAI Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	8.50	0.49	2.56	11.55
1993	6.98	1.91	6.20	15.09
1994	4.46	3.56	4.27	12.29
1995	3.43	3.31	7.70	14.43
1996	5.13	5.41	6.11	16.65
1997	7.88	7.63	5.15	20.66
1998	6.48	10.77	3.13	20.40
1999	9.00	8.49	7.51	25.00
2000	6.35	4.91	5.58	16.85
Year	Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons			
1992	6.32	1.73	n/a	4.72
1993	4.49	a	n/a	2.28
1994	3.70	0.07	n/a	1.38
1995	5.36	a	n/a	1.31
1996	2.14	a	n/a	0.69
1997	2.90	a	n/a	1.20
1998	a	a	n/a	0.86
1999	1.13	a	n/a	0.41
2000	1.50	a	n/a	0.60

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

3.2.4.7 Kodiak Shore Plants

The analysis of catch and discards by sector presented previously found that Kodiak shore plants have had little or no measurable catch or discards of YSOL or RSOL in recent years. Therefore, an analysis of YSOL or RSOL discards as a percent of product tons was not performed for this sector.

Table 51 presents discards of SFLT as a percent of product tons in target fisheries of Kodiak shore plants from 1992-2000. In 1999 and 2000, the SFLT target fishery generated SFLT discards greater or equal to 5 percent of total product tons for this sector. These data suggest that Kodiak shore plants participating in this target fishery may experience significant economic impacts from IR/IU rules for SFLT.

Table 51. Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons in Target Fisheries of Kodiak Shore Plants, 1992-2000

	GOA Fisheries				All BSAI	
	OFLT	PCOD	PLCK	SFLT	Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)					
1992	1.85	8.25	12.26	1.59	1.15	25.09
1993	0.69	8.95	17.66	2.10	0.24	29.64
1994	1.54	6.89	15.90	0.89	0.10	25.33
1995	1.12	13.28	9.28	1.17	0.08	24.94
1996	1.07	11.15	5.03	2.27	0.05	19.58
1997	1.47	11.70	8.11	1.56	0.00	22.84
1998	0.85	9.74	14.69	0.68	0.04	26.01
1999	0.57	13.90	13.45	0.28	0.00	28.20
2000	0.97	11.83	10.35	2.42	0.01	25.58
Year	Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons					
1992	2.04	3.43	1.30	19.80	n/a	3.17
1993	13.68	3.59	4.49	65.43	n/a	8.71
1994	5.27	3.04	0.24	41.18	n/a	2.75
1995	5.30	3.25	0.08	42.14	n/a	3.98
1996	5.99	1.47	1.16	26.19	n/a	4.50
1997	8.13	4.80	1.50	31.18	n/a	5.65
1998	0.26	2.09	0.04	14.61	n/a	1.19
1999	4.64	1.33	0.13	18.97	n/a	1.00
2000	0.66	0.93	0.03	5.91	n/a	1.03

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

3.2.4.8 Southcentral Shore Plants

The analysis of catch and discards by sector presented previously found that Southcentral shore plants have had little or no measurable catch or discards of YSOL or RSOL in recent years. Therefore, an analysis of YSOL or RSOL discards as a percent of product tons was not performed for this sector.

Table 52 presents discards of SFLT as a percent of product tons in target fisheries of Southcentral shore plants from 1992-2000. In 1999 and 2000, none of the target fisheries generated discards of SFLT greater or equal to 5 percent of total product tons for this sector. These data suggest that Southcentral shore plants will not experience significant economic impacts from IR/IU flatfish rules.

Table 52. Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons in Target Fisheries of Southcentral Shore Plants, 1992-2000

	GOA Fisheries				All BSAI	
	OFLT	PCOD	PLCK	SFLT	Fisheries	All Fisheries
Year	**Product Tons (Thousands of Metric Tons)**					
1992	0.00	2.85	0.02	0.00	0.13	2.99
1993	0.01	2.24	0.04	0.05	0.00	2.35
1994	0.00	1.49	0.26	0.00	0.00	1.75
1995	0.00	2.87	0.51	0.00	0.00	3.39
1996	0.06	3.37	0.48	0.01	0.00	3.92
1997	0.12	3.61	2.66	0.02	0.13	6.54
1998	0.19	2.19	4.40	0.00	0.00	6.79
1999	0.24	2.28	1.58	0.00	0.00	4.10
2000	0.12	1.37	0.56	0.00	0.00	2.05
Year	**Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons**					
1992	0.00	1.41	a	0.00	n/a	2.99
1993	a	0.34	a	0.05	n/a	2.35
1994	a	1.32	a	0.00	n/a	1.75
1995	0.00	0.64	a	0.00	n/a	3.39
1996	0.00	0.05	a	0.01	n/a	3.92
1997	5.27	0.53	a	0.02	n/a	6.54
1998	a	0.65	a	0.00	n/a	6.79
1999	a	0.42	a	0.00	n/a	4.10
2000	a	0.01	a	0.00	n/a	2.05

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

3.2.4.9 Floating Processors

Table 53 through Table 55 present discards of RSOL, YSOL and SFLT as a percent of product tons in target fisheries of floating processors from 1992-2000. In 1999 and 2000, none of the target fisheries generated RSOL, YSOL or SFLT discards greater or equal to 5 percent of total product tons for this sector. These data suggest that floating processors will not experience significant economic impacts from IR/IU flatfish rules.

Table 53. Discards of Bering Sea Rock Sole as a Percent of Product Tons in Target Fisheries of Floating Processors, 1992-2000

	BSAI PCOD	BSAI YSOL	All GOA Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	1.42	0.87	6.46	9.14
1993	0.12	0.00	1.51	1.66
1994	0.66	0.41	0.57	1.66
1995	0.94	2.81	1.17	5.13
1996	2.27	0.97	0.85	4.19
1997	1.80	0.00	0.00	1.80
1998	0.79	0.00	0.00	0.79
1999	0.37	0.00	2.57	2.94
2000	6.37	0.00	1.34	7.71
Year	Discards of Bering Sea Rock Sole as a Percent of Product Tons			
1992	5.17	1.59	n/a	1.39
1993	a	0.00	n/a	2.55
1994	9.47	a	n/a	5.60
1995	14.03	a	n/a	4.23
1996	6.31	a	n/a	4.03
1997	a	0.00	n/a	12.87
1998	3.90	0.00	n/a	3.90
1999	3.60	0.00	n/a	0.46
2000	3.08	0.00	n/a	2.54

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 54. Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons in Target Fisheries of Floating Processors, 1992-2000

	BSAI PCOD	BSAI YSOL	All GOA Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	1.42	0.87	6.46	9.14
1993	0.12	0.00	1.51	1.66
1994	0.66	0.41	0.57	1.66
1995	0.94	2.81	1.17	5.13
1996	2.27	0.97	0.85	4.19
1997	1.80	0.00	0.00	1.80
1998	0.79	0.00	0.00	0.79
1999	0.37	0.00	2.57	2.94
2000	6.37	0.00	1.34	7.71
Year	Discards of Bering Sea Yellowfin Sole as a Percent of Product Tons			
1992	0.07	43.19	n/a	4.11
1993	a	0.00	n/a	0.24
1994	0.23	a	n/a	21.50
1995	0.17	a	n/a	6.32
1996	1.92	a	n/a	3.46
1997	a	0.00	n/a	1.17
1998	0.74	0.00	n/a	0.74
1999	0.06	0.00	n/a	0.01
2000	0.21	0.00	n/a	0.17

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for GOA have been aggregated across all species to place more focus on the BSAI area.

Table 55. Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons in Target Fisheries of Floating Processors, 1992-2000

	GOA PCOD	GOA PLCK	All BSAI Fisheries	All Fisheries
Year	Product Tons (Thousands of Metric Tons)			
1992	5.50	0.79	2.70	9.14
1993	1.50	0.00	0.15	1.66
1994	0.57	0.00	1.09	1.66
1995	1.17	0.00	3.96	5.13
1996	0.85	0.00	3.34	4.19
1997	0.00	0.00	1.80	1.80
1998	0.00	0.00	0.79	0.79
1999	0.91	1.66	0.37	2.94
2000	1.28	0.06	6.37	7.71
Year	Discards of Gulf of Alaska Shallow-water Flatfish as a Percent of Product Tons			
1992	4.82	0.76	n/a	3.25
1993	2.88	a	n/a	2.61
1994	0.92	0.00	n/a	0.32
1995	1.09	a	n/a	0.25
1996	0.08	0.00	n/a	0.02
1997	a	0.00	n/a	0.00
1998	0.00	0.00	n/a	0.00
1999	0.71	a	n/a	0.22
2000	1.53	a	n/a	0.26

Source: NPFMC Sector Profiles Database, 2001

a: Number cannot be released because of NMFS data confidentiality policies

Note: Product tons for BSAI have been aggregated across all species to place more focus on the GOA area.

3.2.4.10 Concluding Summary of Analysis of Discards as a Percent of Product Tons

The analysis of discards as a percent of product tons further refines the list of sectors and target fisheries that may experience adverse economic effects from IR/IU rules. The analysis showed that the economic effects of IR/IU flatfish rules will be negligible for pot catcher processors, longline catcher processors, Southcentral shore plants and floating processors. In addition, the analysis of catch and discards related to the IR/IU flatfish revealed that the economic effects of IR/IU flatfish rules will be negligible for Southeast shore plants and motherships. Thus, the analysis of existing conditions shows that the sectors and target fisheries that may experience significant economic effects from IR/IU flatfish rules are those depicted in Table 56.

Table 56. Processing Sectors and Target Fisheries Potentially Affected by IR/IU Flatfish Rules.

Processing Sector	IR/IU Flatfish		
	BSAI rock sole	BSAI yellowfin sole	GOA shallow-water flatfish
Surimi and fillet trawl catcher processors	Pacific cod rock sole	yellowfin sole	none
Head and gut trawl catcher processors	other flatfish Pacific cod pollock rock sole yellowfin sole	other flatfish rock sole yellowfin sole	shallow-water flatfish Pacific cod
Bering Sea pollock shore plants	Pacific cod	none	none
Alaska Peninsula-Aleutian Islands shore plants	Pacific cod	none	none
Kodiak shore plants	none	none	shallow-water flatfish

3.2.5 Description of Catcher Vessel Sectors Potentially Affected by IR/IU/IU Flatfish Rules

As indicated in the discussion of processing sectors, there do not appear to be any fixed gear catcher vessel fisheries with significant discards of IR/IU flatfish and only the following three trawl catcher vessel fisheries have appreciable IR/IU flatfish discards: BSAI Pacific cod, GOA Pacific cod and GOA shallow-water flatfish.

Historical catches and discards of IR/IU flatfish by trawl catcher vessels are highest in the BSAI Pacific cod fishery, both in terms of volume and percent by weight of retained groundfish. During the 1992-2000 period, discards of RSOL and YSOL were 12.6 percent of the total amount of groundfish retained. In the same period, discards of SFLT in the GOA Pacific cod fishery were only 1.6 percent of total retained groundfish, while discards of SFLT in the SFLT target fishery were 9.8 percent of the total amount of groundfish retained.

Over 75 percent of trawl catcher vessel gross revenue was generated from landings of pollock and 20 percent was generated in Pacific cod fisheries. Only 3 percent of trawl catcher vessel gross revenue was generated from landings of flatfish. Moreover, since 1998, flatfish have accounted for only 1 percent of total gross revenue. Clearly, pollock and Pacific cod are the mainstay of trawl catcher vessels, and because bottom trawling for pollock was prohibited in 1999, IR/IU flatfish regulation are likely to affect only those trawl catcher vessels that participate in Pacific cod fisheries. An exception to this generalization may be found among those vessels that participate in the relatively small SFLT fishery (see Table29 in Section 2.2.3).

Table 57 shows the estimated annual discards of IR/IU flatfish by all trawl catcher vessels in the BSAI and GOA Pacific cod fisheries and SFLT fishery. For each fishery, the table shows the amount of discarded IR/IU flatfish by species or species complex in terms of volume (a "D-" followed by the abbreviation for metric tons) and percent by weight of retained groundfish (a "D-" followed by a percent sign). For example, **D-RSOL (mt)** indicates the tons of discarded RSOL, while **D-SFLT (%)** indicates discards of SFLT as a percent of retained groundfish tons (**R-GFSH (mt)**). Thus, in the 2000 BSAI Pacific cod fishery there were approximately 1,594 mt of discarded RSOL, 142 mt of discarded YSOL and 39,135 mt of retained groundfish. Discards of rock sole amounted to 4.1 percent by weight of retained groundfish while discards of yellowfin sole were 0.4 percent by weight of retained groundfish. In the 2000 GOA Pacific cod fishery, the 222 mt of discarded SFLT was 1.0 percent of the 21,351 mt of retained groundfish. Discards of SFLT in the SFLT fishery amounted to 1.9 percent of the 7,470 mt of retained groundfish.

Overall, it appears that trawl catcher vessel discards of IR/IU flatfish have decreased in recent years. In 2000, IR/IU flatfish discards in the BSAI PCOD fishery were 4.5 percent of retained groundfish as compared to 12.6 percent over the entire 1992-2000 period. Similarly, average flatfish discards in the shallow-water flatfish fishery fell to 1.9 percent in 2000. While the data presented in the table are limited to the period 1992-2000, more recent data for 2001 and 2002 confirm the low levels of discards seen in 2000. Based on these results, it appears that the proposed IR/IU action is unlikely to have significant impacts on trawl catcher vessels. A more detailed treatment of the trawl catcher vessel sector is presented in Section 2.2.3.

Table 57. IR/IU Flatfish Discards by All Trawl Catcher Vessels, 1992-2000

	BSAI Pacific Cod Fishery					GOA Pacific Cod Fishery			GOA Shallow-water Flatfish Fishery		
Year	D-RSOL (mt)	D-YSOL (mt)	R-GFSH (mt)	D-RSOL (%)	D-YSOL (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)	D-SFLT (mt)	R-GFSH (mt)	D-SFLT (%)
1992	751	175	19,444	3.9	0.9	1,108	42,306	2.6	339	5,166	6.6
1993	2,868	411	24,245	11.8	1.7	677	30,452	2.2	1,384	6,678	20.7
1994	4,994	445	35,117	14.2	1.3	398	27,799	1.4	365	2,584	14.1
1995	5,837	120	35,578	16.4	0.3	648	33,392	1.9	493	3,113	15.8
1996	5,650	977	44,267	12.8	2.2	279	34,633	0.8	596	7,096	8.4
1997	6,899	322	42,799	16.1	0.8	781	42,689	1.8	488	4,868	10.0
1998	2,387	174	32,744	7.3	0.5	386	33,466	1.2	99	2,181	4.5
1999	4,362	46	29,381	14.8	0.2	271	33,507	0.8	53	1,004	5.2
2000	1,594	142	39,135	4.1	0.4	222	21,351	1.0	143	7,470	1.9

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC.

3.3 Description of the Alternatives

In June 2002, the Council adopted the following IR/IU alternatives (which were described in greater detail in Section 1.2 of the EA):

Alternative 1: The status quo/no action alternative—the existing IR/IU regulations for flatfish in the BSAI and GOA would be implemented beginning in 2003.

Alternative 2: Revise IR/IU regulations for flatfish—regulations would allow some discards of the IR/IU flatfish species. The percent retention requirement would be set independently for each species and would range from 50 percent to 90 percent. In addition, the alternative would consider either dropping the retention requirements entirely or requiring 100 percent retention.

Alternative 3: Delay implementation of IR/IU regulations for flatfish—implementation would be delayed for up to three years.

This alternative includes the following trailing amendments:

> **Amendment A:** Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.
>
> **Amendment B:** Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. This amendment would provide a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.

Amendment C: Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch, regardless of the species composition of the catch.

Alternative 4: Exempt fisheries from IR/IU flatfish regulations if flatfish discards are less than 5 percent of their total groundfish catch. Under this alternative, implementation of IR/IU flatfish regulations would take place in 2003. A suboption, which allows separate exemptions by TAC region, catcher vessels and catcher processors and AFA/Non-AFA vessels, is analyzed.

Preferred Alternative: The Preferred Alternative is a combination of Alternatives 3 and 4, resulting in a two-step process as follows: Step 1 would delay implementation of full retention requirements for flatfish in the BSAI until June of 2004, while Step 2 would develop alternative means to accomplish bycatch (discard) reductions, while maintaining the economic viability of the fleet participating in these fisheries. Implementation of IR/IU flatfish regulations would begin as scheduled in 2003 in the GOA, where adverse impacts are not expected to be significant. The following trailing amendments will be analyzed with the expectation that these amendments could augment or replace IR/IU regulations for flatfish prior to the end of the delay period.

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.

Amendment B: Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. This amendment would provide a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.

Amendment C: Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch, regardless of the species composition of the catch.

Amendment D: Establish a regulatory process for the routine review of flatfish discards in the BSAI and GOA fisheries and the exemption of fisheries with less than a 5 percent bycatch of IR/IU flatfish from flatfish retention and utilization rules.

3.4 Economic and Social Effects

NMFS guidance for preparation of RIRs provides that, *"At a minimum, the RIR ... should include a good qualitative discussion of the economic effects of the selected alternatives. Quantification of the effects is desirable, but the analyst needs to weigh such quantification against the significance of the issue and available studies and resources"* (NMFS 2000).

Research results and data on many key topics pertaining to the proposed action are limited. Almost no empirical data are available, for example, concerning the cost and operating structure of the sectors of the groundfish fishing industry that would be affected; the potential market for flatfish currently discarded; the fleet behavioral response to alternative fishing opportunities; or the determinants of demand for flatfish products. Indeed, because the status quo alternative may require the industry to retain fish with which they have little historical experience in processing and marketing, it is probable that even the industry itself cannot fully anticipate the cost, revenue and operational impacts they may incur as they adjust to the IR/IU requirements for the 2003 fishing year and beyond. By necessity, therefore, much of this analysis is qualitative, although impacts have been quantified and monetized where possible.

There are two principal parts to the analysis presented here. The analysis presents potential costs and benefits attributable to or deriving from the alternative measures under consideration by the NPFMC. This part of the analysis is conducted from the point of view of all U.S. citizens (i.e., what is likely to be the "net benefit to the Nation"?). The costs and the benefits of the alternatives are, however, not homogeneously distributed across that population. Many of the costs, in particular, are highly concentrated in certain sectors of the groundfish fishing industry that operate in the Gulf of Alaska and in the Bering Sea and Aleutian Islands. Therefore, the analysis also reviews and evaluates, to the extent practicable, distributional issues and implications of the alternatives.

The analysis has been broken into four components that correspond to different categories of benefits and costs. These categories are:

1. Changes in revenues and operating costs of firms in the fisheries (Section 3.4.1)
2. Changes in fleet size and composition (Section 3.4.2)
3. Effects on consumers from changes in groundfish production (Section 3.4.3)
4. Monitoring and enforcement issues (Section 3.4.4)

Section 3.4.5 summarizes the costs and benefits to the Nation of IR/IU regulations for flatfish and discusses non-economic considerations related to the concept of "waste" in fisheries.

3.4.1 Changes in Revenues and Operating Costs of Firms in the Fisheries

3.4.1.1 Alternative 1

Head and Gut Trawl Catcher Processors

Alternative 1 (status quo) has the potential to cause significant negative economic impacts on all of the vessels in the head and gut trawl catcher processor (HT-CP) sector. These vessels primarily produce headed and gutted products from flatfish, Atka mackerel and rockfish caught in the BSAI and GOA fisheries. In 2000, there were 24 vessels in this sector. As shown in Table 58, the flatfish discard rates of HT-CPs are significant in five fisheries that target flatfish (BSAI RSOL, YSOL and OFLT fisheries and GOA SFLT fishery) and three fisheries in which flatfish are caught incidentally (BSAI PCOD and PLCK fisheries and GOA PCOD fishery). In 2000, these fisheries accounted for about 67 percent of the gross revenues of this sector. The fisheries listed that occur in the BSAI are especially important, accounting for around 65 percent of the gross revenues. Participants in this sector report that the flatfish discarded have little or no market value because they are either too small, of low quality, or, in the case of RSOL, are males without roe.

Table 58. Summary of Impacts of Full Retention Requirement on the HT-CP Sector, 2000

	BSAI					GOA	
	OFLT	PLCK	PCOD	RSOL	YSOL	PCOD	SFLT[a]
No. of Participants	24	9	22	23	23	22	5
% of Sector Total Gross Revenues	15.42	0.70	13.92	14.06	21.00	1.57	0.12
IR/IU Flatfish Discard % of IR/IU Flatfish Catch	34.56	50.00	63.07	48.51	19.24	67.52	3.28
IR/IU Flatfish Discard % of Product Weight	19.63	0.87	49.52	125.06	35.99	24.05	3.28

Note: [a] 1998 data is used instead of 2000 data due to NMFS data confidentiality policies
Source: NPFMC Sector Profiles Database, 2001

The status quo would have a negative effect on the HT-CP sector by decreasing gross revenues and/or increasing operating costs. The magnitude of the negative effect on gross revenues depends on 1) how much the additional flatfish retained would decrease the vessel hold space available for more valuable product and 2) whether there will be any revenue earned from product derived from the additional flatfish retained. If vessel catch is constrained by hold space during a trip, the amount of product from higher-valued species that would potentially be displaced by retained flatfish under the status quo is substantial in a number of fisheries. In the BSAI rock sole fishery, for example, it is estimated that the amount of flatfish discarded in 2000 represented 125 percent of the product weight of flatfish retained, for that year.

The amount of more valuable fish displaced depends on how the additional flatfish retained are processed. Under the status quo processors are required to create products that yield at least 15 percent from each fish harvested. Processing the additional flatfish retained at this minimum level would reduce the amount of higher-valued fish displaced, but would increase operating costs and be more time consuming. If there is 100 percent utilization of the additional flatfish (e.g., the fish are processed as round frozen product) operating costs associated with handling (e.g., sorting) and processing would be reduced. However, the displacement of more valuable fish would increase. If vessel hold space is limited, the "discard % of product weight" (DPP) figures in Table 58 represent the amount of displacement that would occur. These figures can be interpreted as the percentage of revenue tonnage displaced. The table shows that the DPP for HT-CP vessels is highest in the rock sole target fishery, where it is more than 120 percent

Retention of flatfish in a fishery that is targeting non-flatfish, such as the PCOD fishery, presents added problems, as it requires a conversion of processing lines and can reduce the quality of target species harvested. When targeting Pacific cod, the processing line on catcher processors is configured for processing round fish. Switching to processing flatfish requires a time-consuming line conversion. The time lost represents an opportunity cost, as it would otherwise be spent catching and processing higher-value fish. If the amount of flatfish retained is relatively small a catcher processor may prefer to hold the flatfish until enough has been caught to justify a processing run.

Operators in the HT-CP fleet report that they are attempting to find markets for all flatfish harvested. They indicate some success in finding new markets for BSAI yellowfin sole and GOA shallow-water flatfish. However, the market for BSAI rock sole is still limited primarily to females with roe. Processing the additional flatfish into fish meal is not possible for most HT-CP vessels, as they are not equipped with fish meal processing capability, and loadline requirements, class restrictions and space constraints make the addition of onboard meal plants infeasible. An alternative that has been suggested is donation of IR/IU flatfish to a food bank or charity food distribution entity. However, food banks generally want an IQF fillet or similar product. Most of the IR/IU flatfish discarded are too small to be processed into this product form.

To the extent that the "race for fish" allows it, HT-CP vessels may offset to some extent the lost revenues or additional costs experienced under the status quo by taking additional fishing trips. However, the number of profitable trips vessels can make may be limited by seasonal decreases in fish quality and/or roe content that lower ex-vessel prices.

Smaller HT-CP vessels may be disproportionately affected by the status quo, as they are more likely constrained by hold space during a fishing trip, their processing capacity is more limited, and their slower speed restricts their ability to increase revenue by taking additional trips.

The effects of IR/IU rules are also a function of the annual round of fisheries in which vessel operate. For instance, a vessel that is more dependent on the rock sole fishery will suffer greater negative economic impacts than one that relies primarily on Atka mackerel or rockfish fisheries. To some extent, the vessels most affected may be able to offset income losses by switching to other fisheries. However, this shift in fishing effort could indirectly create economic hardship in the form of reduced profitability

for the fishermen already engaged in these other fisheries. Catch per unit effort and individual harvest for existing fishermen could decline substantially due to crowding and intensified fishing pressure on stocks. The burden of IR/IU rules could result in an overall decrease in the number of active HT-CP vessels through bankruptcy or other forms of economic dislocation.

Processing Sectors Other than the HT-CP Sector

Alternative 1 (status quo) would also have a negative economic effect on a portion of the surimi and fillet trawl catcher processor (ST&FT-CP) fleet and some Bering Sea pollock (BSP-SP), Alaska Peninsula and Aleutian Islands (APAI-SP) and Kodiak (K-SP) shore plants.

Surimi trawl catcher processors have the necessary processing equipment to produce surimi from groundfish, while fillet trawl catcher processors have the processing equipment to produce fillets from groundfish. The fishing effort of both of these vessel classes is concentrated in the BSAI pollock fishery. However, some ST&FT-CP vessels fish Pacific cod or yellowfin sole after pollock seasons.

Participation by surimi and fillet trawler catcher processors in fisheries in which flatfish are targeted (BSAI YSOL fishery) or caught incidentally (BSAI PCOD fishery) is lower in comparison to the HT-CP sector. In 2000, only four of the 15 active surimi and fillet trawler catcher processors participated in the BSAI PCOD and YSOL fisheries (Table 59). The gross revenues earned by the ST&FT-CP fleet in these fisheries was less than two percent of the sector's total earnings. The discard rate for rock sole in the BSAI Pacific cod fishery is high, but these discards represent less than 15 percent of product weight.

Table 59. Summary of Impacts of Full Retention Requirement on Processing Sectors Other than the HT-CP Sector, 2000

	BSAI				GOA
	ST&FT-CP PCOD	BSP-SP PCOD	APAI-SP PCOD	ST&FT-CP YSOL	K-SP SFLT
No. of Participants	4	5	8	4	7
% of Sector Total Gross Revenues	0.94	12.36	18.40	0.61	9.23
IR/IU Flatfish Discard % of IR/IU Flatfish Catch	86.95	99.71	87.88	0.98	3.02
IR/IU Flatfish Discard % of Product Weight	14.70	8.63	4.76	4.14	5.91

Source: NPFMC Sector Profiles Database, 2001

As with HT-CP vessels, the ST&FT-CP vessels affected will experience displacement of higher-value species under the status quo if they normally fill their holds to capacity. This displacement will lower per trip revenue. The amount of gross revenues foregone could be decreased by reducing the utilization rate to the 15 percent minimum required under the status quo, but the additional processing required would increase operating costs. Most ST&FT-CP vessels have fish meal plants on board. However, the four ST&FT-CP vessels that participated in the BSAI PCOD and YSOL fisheries in 2000 are not equipped with fish meal processing capability, and vessel size makes the addition of onboard meal plants impractical.

Shore-based processing plants that will be required to retain additional flatfish landed by catcher vessels will also experience some cost impacts. Bering Sea pollock shore plants and Alaska Peninsula and Aleutian Islands shore plants do not operate in the flatfish target fisheries, but they are significant participants in the Pacific cod trawl fisheries, which generate considerable amounts of flatfish discards. Bering Sea pollock shore plants and Alaska Peninsula and Aleutian Islands shore plants respectively earned more than 12 and 18 percent of their total wholesale value from the BSAI PCOD fishery (Table 60). Also affected would be Kodiak shore plants, which earn nine percent of their total wholesale value from the GOA SFLT fishery.

Shore-based processing plants that will be required to accept additional flatfish from catcher vessels will also experience several cost impacts. These will likely include the cost of labor to offload IR/IU flatfish from vessels, storage costs and meal processing costs. If current meal processing capacity is being fully utilized, shore plants would have to expand their facilities, thereby incurring increased capital costs. Other costs that could affect shore plants are increased costs associated with applying for additional discharge capacity under the NPDES program. In addition, the value of soft-fleshed Pacific cod may be reduced because of damage that can occur when transported in the same hold as rough-scaled flatfish. The ability of shore plants to recover these costs will depend on how much revenue they can earn from processing and selling the additional flatfish. Industry representatives report that shore-based meal operations currently tend to just break-even. If the plants cannot market the additional flatfish as fish meal or other products they may face delivery costs for shipment to a disposal site. Alternatively, floating meal barges may accept the additional flatfish landed. The operators of these barges have expressed interest in processing the additional flatfish into fish meal, although the economic viability of such an arrangement has not been rigorously tested in the BSAI or GOA fishery arena.

Catcher Vessels

Catcher vessels harvest groundfish and deliver their catch to shore-based processing plants or motherships. These vessels can be divided into two general categories—trawl vessels and fixed gear vessels. The trawl catcher vessels are the only catcher vessel sectors that currently have more than minimal catches of flatfish. In the GOA there is a regular SFLT target fishery prosecuted by catcher vessels based in Kodiak. As shown in Table 60, however, most of the discarding of flatfish by catcher vessels occurs in the Pacific cod fisheries in the BSAI.

Table 60. Summary of Impacts of Full Retention Requirement on Catcher Vessel Sectors, 2000

	TCV BSP ≥ 125			TCV BSP 60-124			TCV Div. AFA			TCV Non-AFA			TCV < 60		
	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT
No. of Participants	22	2	--	40	1	1	15	16	1	6	31	6	1	45	--
% of Sector Total Gross Revenues	4.09	0.14	--	12.22	0.28	--	32.09	9.19	--	10.33	26.20	0.35	0.70	67.74	--
IR/IU Flatfish Discard % of IR/IU Flatfish Catch	98.6	100	--	99.4	96.8	2.3	94.0	26.5	2.4	99.7	23.5	2.9	100	68.3	--
IR/IU Flatfish Discard % of GRDFSH Retained	4.2	1.0	--	4.2	1.0	1.9	4.2	0.9	1.5	4.2	1.0	1.5	4.2	1.0	--

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC

Catcher vessels face a set of revenue and cost effects from the status quo similar to those faced by catcher processors. If hold space is limited, the additional flatfish retained would displace fish of higher value, thereby decreasing per trip revenues. The problem of damaging non-flatfish, such as Pacific cod, by mixing rough-scaled flatfish and soft-fleshed roundfish in the hold may be a problem for catcher vessels. This problem may be avoided if flatfish are segregated in a separate hold. However, most catcher vessels are unlikely to be able to dedicate an entire hold to the relatively small amount of flatfish that are likely to be taken. Furthermore, it is generally reported that many (perhaps most) of these catcher vessels do not have the capacity to sort their catch at sea, under any circumstance.

3.4.1.2 Alternative 2

The analysis examines a range of required retention percentages for each of the types of IR/IU flatfish. As in Alternative 1, economic impacts on processors are measured in terms of discards as a percent of product weight in 2000. Recall that this measure can be interpreted as a displacement of revenue tonnage if hold space is limited.

With regard to the effects of Alternative 2 on the HT-CP sector, Table 61 shows that the retention requirement for BSAI RSOL would have to be reduced to 50 percent in order to nearly eliminate potential impacts in the BSAI RSOL target fishery. However, discard rates of BSAI RSOL in the non-RSOL target fisheries tend to be higher than within the target fishery. Even a 50 percent retention requirement for BSAI RSOL has a potentially significant adverse economic effect on some HT-CP vessels participating in the Pacific cod fishery.

Table 61. Summary of Impacts of Alternative BSAI RSOL Retention Requirements on the HT-CP Sector, 2000

	HT-CP				
	OFLT	PCOD	PLCK	RSOL	YSOL
RSOL Discard % of RSOL Catch	59.33	66.35	60.93	50.50	57.36
RSOL Discard % of Product Weight					
100 Percent Retention Requirement	9.04	40.94	1.22	119.39	10.25
90 Percent Retention Requirement	7.52	34.22	1.04	95.75	8.47
85 Percent Retention Requirement	6.75	30.86	0.95	83.93	7.57
75 Percent Retention Requirement	5.23	24.14	0.76	60.29	5.79
60 Percent Retention Requirement	2.95	14.06	0.49	24.82	3.10
50 Percent Retention Requirement	1.42	7.34	0.30	1.18	1.32

Source: NPFMC Sector Profiles Database, 2001

As shown in Table 62, the retention requirement for BSAI RSOL would also have to be reduced to less than 50 percent in order to eliminate potential effects on ST&FT-CP vessels and Bering Sea pollock and Alaska Peninsula and Aleutian Islands shore plants participating in the Pacific cod fishery.

Table 62. Summary of Impacts of Alternative BSAI RSOL Retention Requirements on Sectors Other Than the HT-CP Sector, 2000

	ST&FT-CP	BSP-SP	APAI-SP
	PCOD	PCOD	PCOD
RSOL Discard % of RSOL Catch	86.95	99.71	87.88
RSOL Discard % of Product Weight			
100 Percent Retention Requirement	14.70	8.63	4.76
90 Percent Retention Requirement	13.01	7.76	4.22
85 Percent Retention Requirement	12.16	7.33	3.95
75 Percent Retention Requirement	10.47	6.46	3.41
60 Percent Retention Requirement	7.94	5.17	2.60
50 Percent Retention Requirement	6.25	4.30	2.05

Source: NPFMC Sector Profiles Database, 2001

A retention requirement of 85 percent for BSAI YSOL would have no impact on the HT-CP sector in the target fishery for BSAI YSOL, but would create potential adverse economic and operational impacts in the non-BSAI YSOL target fisheries (Table 63). For example, the retention rate for BSAI YSOL would have to be less than 50 percent to avoid impacts in the BSAI Pacific cod fishery. In contrast, a retention requirement of 90 percent for BSAI YSOL would be expected to have no discernable effect on the ST&FT-CP sectors.

Table 63. Summary of Impacts of Alternative BSAI YSOL Retention Requirements on the ST&FT-CP and HT-CP Sectors, 2000

	ST&FT-CP	HT-CP			
	YSOL	OFLT	PCOD	RSOL	YSOL
YSOL Discard % of YSOL Catch	0.98	25.50	75.88	26.49	15.20
YSOL Discard % of Product Weight					
100 Percent Retention Requirement	4.14	10.60	8.61	5.68	25.73
90 Percent Retention Requirement	0.00	6.44	7.48	3.54	8.81
85 Percent Retention Requirement	0.00	4.36	6.91	2.46	0.34
75 Percent Retention Requirement	0.00	0.21	5.77	0.32	0.00
60 Percent Retention Requirement	0.00	0.00	4.07	0.00	0.00
50 Percent Retention Requirement	0.00	0.00	2.94	0.00	0.00

Source: NPFMC Sector Profiles Database, 2001

A retention requirement of 90 percent for GOA SFLT would have no impact on the HT-CP sector in the target fishery for GOA SFLT based on data from recent years (Table 64). However, in the GOA Pacific cod fishery the HT-CP sector would likely experience impacts at even a 50 percent retention requirement for GOA SFLT. A 90 percent retention requirement for GOA SLFT would be expected to have no discernable impact on Kodiak shore plants.

Table 64. Summary of Impacts of Alternative GOA SFLT Retention Requirements on the HT-CP and K-SP Sectors, 2000

	HT-CP		K-SP
	PCOD	SFLT1	SFLT
SFLT Discard % of SFLT Catch	67.52	3.28	3.02
SFLT Discard % of Product Weight			
100 Percent Retention Requirement	24.05	3.28	5.91
90 Percent Retention Requirement	20.49	0.00	0.00
85 Percent Retention Requirement	18.71	0.00	0.00
75 Percent Retention Requirement	15.15	0.00	0.00
60 Percent Retention Requirement	9.80	0.00	0.00
50 Percent Retention Requirement	6.24	0.00	0.00

Source: NPFMC Sector Profiles Database, 2001

[1] 1998 data is used instead of 2000 data due to NMFS data confidentiality policies

Catcher Vessels

The analysis of the effects of alternative retention requirements on catcher vessels shows that virtually 100 percent of the catch of BSAI RSOL and BSAI YSOL is discarded in all the fisheries in which BSAI RSOL and BSAI YSOL are caught. Consequently, any retention requirement for BSAI RSOL or BSAI YSOL would be expected to result in adverse economic and operational impacts. As shown in Table 65, however, even a 100 percent retention requirement for these IR/IU flatfish species will have a minor economic impact on catcher vessels in terms of discards as a percent of the weight of groundfish retained in 2000. This measure can be interpreted as a displacement of revenue tonnage. A full retention requirement for BSAI RSOL would have the greatest effect, and this requirement would result in less than a five percent displacement in revenue tonnage for all catcher vessel classes. The economic effect of any GOA SFLT retention requirement on catcher vessels is also likely negligible.

Table 65. Summary of Impacts of a Full Retention Requirement for IR/IU Flatfish on Catcher Vessel Sectors, 2000

Discards as a percent of groundfish retained	TCV BSP ≥ 125			TCV BSP 60-124			TCV Div. AFA			TCV Non-AFA			TCV < 60		
	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT	BSAI PCOD	GOA PCOD	GOA SFLT
RSOL Discards	3.9	--	--	3.9	--	--	3.9	--	--	3.9	--	--	--	--	--
YSOL Discards	0.3	--	--	0.3	--	--	0.3	--	--	0.3	--	--	--	--	--
SFLT Discards	--	1.0	--	--	1.0	1.9	--	1.0	1.9	--	1.0	1.9	--	1.0	--

Source: NMFS Blend and PSC Data provided by NMFS-AFSC and CFEC Fish Ticket data provided by NPFMC

3.4.1.3 Alternative 3

Alternative 3 would delay implementation of IR/IU flatfish rules for up to 3 years. Delaying implementation will postpone the severe economic consequences discussed under Alternative 1 and will allow the benefits of the economic activity associated with the operation of these vessels to accrue to vessel operators, crew, and fishing communities for the period of the delay.

A delay in implementation would provide time for the NPFMC to analyze the effects of measures in the following trailing amendments:

> **Amendment A:** Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.
>
> **Amendment B:** Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. The purpose of this amendment is to ensure that discarding of flatfish does not increase. In addition, the amendment provides a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.
>
> **Amendment C:** Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. Each vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Additional details regarding the trailing amendments including decision points developed by the NPFMC's IR/IU Technical Committee are provided in Appendix A.

A delay in implementation could also provide time for assessment of the potential for rationalization within the IR/IU flatfish fisheries. These fisheries are characterized by a "race for fish" mode of operation that exacerbates the economic impacts of the IR/IU rules. Rationalization may ease some aspects of the "race for fish", but may not eliminate all aspects because IR/IU flatfish are targeted during specific roe seasons and times of highest quality. However, possibilities for fleet consolidation or cooperative operations that might ease the economic burden of IR/IU flatfish rules could be explored during a delay in implementation.

In the past several years, discards of GOA shallow-water flatfish and BSAI yellowfin sole have been trending downward. Industry sources indicate that they have been doing all that they can to utilize all

the IR/IU flatfish that they harvest and are actively attempting to develop markets for smaller fish. It is possible that this trend could continue during a delay in implementation. For example, a delay might allow time for development of additional meal processing capacity and/or development of new technologies, such as fish protein powder processing.

3.4.1.4 Alternative 4

Alternative 4 exempts fisheries from IR/IU flatfish regulations if flatfish discards are less than 5 percent of total groundfish catch. This analysis used two different estimates of the discard rates for determination of the IR/IU exemption—one estimate is based on a weighted average discard rate for 1995-2001, and a second estimate is based on a weighted average discard rate for 1999-2001. As shown in Table 66 and Table 67 discards exceed 5 percent (shaded cells in the right-most column) in most flatfish fisheries and in Pacific cod trawl fisheries in the BSAI, but in the GOA, only in the very small Western Gulf Shallow-water flatfish fishery.

Table 66. IR/IU Flatfish Discards as a Percent of Total Groundfish Catch, in the BSAI, 1995-2001

Fishery	1995	1996	1997	1998	1999	2000	2001	Average 00-01	Average 99-01
IRIU Flatfish Discards as Percent of Total Groundfish Catch in Aleutian Islands Subarea Fisheries									
AI Atka Mackerel (All Gears)	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0
AI CDQ Atka Mackerel	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0
AI CP Pollock	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
AI Mothership Pollock	-	-	-	-	-	-	-	-	-
AI Shorebased Pollock	0.0	0.0	-	0.0	-	-	-	0.0	-
AI CDQ Pollock	-	-	-	-	-	-	-	-	-
AI Rockfish (All Gears)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AI CDQ Rockfish	-	-	-	0.0	0.0	0.0	-	0.0	0.0
AI IFQ Sablefish	0.0	0.0	-	-	-	0.1	0.0	0.0	0.0
AI Trawl Sablefish	-	-	-	-	-	-	-	-	-
AI CDQ Sablefish	-	-	-	-	-	-	-	-	-
AI Turbot (All Gears)	0.0	-	-	0.0	-	-	-	0.0	-
AI CDQ Turbot	-	-	-	-	-	-	-	-	-
IRIU Flatfish Discards as Percent of Total Groundfish Catch in Bering Sea Subarea Fisheries									
BS Atka Mackerel (All Gears)	-	0.1	-	0.8	1.3	0.9	0.0	0.9	1.1
BS CDQ Atka Mackerel	-	-	-	-	0.4	-	-	0.4	0.4
BS CP Pollock	0.3	0.5	0.4	0.3	0.2	0.5	0.1	0.3	0.3
BS Mothership Pollock	0.1	0.1	0.1	0.0	0.2	0.2	0.0	0.1	0.1
BS Shorebased Pollock	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BS CDQ Pollock	0.2	0.3	0.0	0.0	0.2	0.4	0.1	0.2	0.2
BS Rockfish (All Gears)	-	0.0	1.2	3.1	-	0.5	0.1	0.3	0.1
BS CDQ Rockfish	-	-	-	-	-	-	-	-	-
BS IFQ Sablefish	0.0	-	-	-	-	-	0.0	0.0	0.0
BS Trawl Sablefish	-	0.2	-	-	-	-	0.1	0.1	0.1
BS CDQ Sablefish	-	-	-	-	-	-	-	-	-
BS Turbot (All Gears)	0.1	0.0	0.0	0.1	0.8	0.0	0.0	0.2	0.3
BS CDQ Turbot	-	-	-	0.0	-	-	-	0.0	-
IRIU Flatfish Discards as Percent of Total Groundfish Catch in BSAI-wide Fisheries									
BSAI Arrowtooth (All Gears)	-	**8.1**	0.0	3.4	0.9	2.8	0.2	1.6	1.2
BSAI CDQ Arrowtooth (All Gears)	-	-	-	0.0	0.2	0.1	-	0.2	0.2
BSAI Flathead Sole (All Gears)	**10.6**	**13.8**	**10.6**	**14.9**	**11.6**	**7.4**	3.6	**10.3**	**7.6**
BSAI CDQ Flathead Sole (All Gears)	-	-	-	**6.5**	**9.0**	**8.4**	3.5	**8.0**	**8.5**
BSAI Other Flatfish (All Gears)	**19.8**	**14.0**	**7.8**	**13.0**	4.4	4.8	0.3	**14.2**	4.2
BSAI CDQ Other Flatfish (All Gears)	-	-	-	-	0.0	-	-	0.0	0.0
BSAI Other Groundfish (All Gears)	-	-	2.0	-	-	-	0.0	0.0	0.0
BSAI CDQ Other Groundfish (All Gears)	-	-	-	-	-	-	-	-	-
BSAI Longline CP Pacific Cod	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.2	0.4
BSAI Longline CV Pacific Cod	-	0.0	-	-	0.0	0.0	0.0	0.0	0.0
BSAI Pot Pacific Cod	0.4	0.8	0.3	0.7	0.4	0.4	0.3	0.5	0.4
BSAI Trawl CV Pacific Cod	**9.8**	**9.0**	**9.4**	**6.4**	**10.2**	3.6	3.5	**8.1**	**6.1**
BSAI Trawl CP Pacific Cod	**10.5**	**8.0**	**10.3**	**8.0**	**9.6**	**14.1**	**8.6**	**9.9**	**10.8**
BSAI Non-AFA Trawl CP Pacific Cod	**11.8**	**9.5**	**13.2**	**9.7**	**12.4**	**15.9**	**9.7**	**11.9**	**12.8**
BSAI AFA Trawl CP Pacific Cod	2.9	3.8	2.6	2.4	3.1	2.9	2.1	2.9	2.9
BSAI CDQ Pacific Cod (All gears)	2.8	-	-	0.1	0.5	0.1	0.2	0.3	0.3
BSAI Rock Sole (All Gears)	**26.4**	**20.6**	**25.2**	**25.6**	**30.0**	**32.3**	**13.7**	**25.2**	**26.4**
BSAI CDQ Rock Sole (All Gears)	-	-	-	**7.9**	**21.0**	-	-	**20.6**	**21.0**
BSAI Yellowfin Sole (All Gears)	**15.0**	**16.1**	**15.2**	**14.7**	**15.4**	**11.5**	**7.5**	**14.2**	**11.5**
BSAI CDQ Yellowfin Sole (All Gears)	-	-	-	-	**8.3**	-	**34.5**	**10.6**	**10.6**

Source: NMFS Blend Data, 1995-2001.
Notes:
1) Shaded cells with black text indicate the years in which discards of IR/IU flatfish exceed 5 percent of total groundfish catch.
2) Averages shown in the last two columns are weighted averages of available data.

Table 67. IR/IU Flatfish Discards as a Percent of Total Groundfish Catch, in the GOA, 1995-2001

	1995	1996	1997	1998	1999	2000	2001	Average 00-01	Average 99-01
IRIU Flatfish Discards as Percent of Total Groundfish Catch in Western Gulf Subarea Fisheries									
WG Arrowtooth (All Gears)	-	0.6	-	-	0.0	0.1	0.1	0.1	0.1
WG Atka Mackerel (All Gears)	-	0.3	-	-	-	-	-	0.3	-
WG Deep-water Flatfish (All Gears)	-	-	-	-	-	-	-	-	-
WG Flathead Sole (All Gears)	0.3	1.0	0.3	1.3	-	**9.8**	0.8	0.8	1.2
WG Offshore Pacific Cod (All Gears)	1.3	0.3	3.2	0.0	0.2	**7.1**	0.0	2.0	2.8
WG Inshore Pacific Cod (All Gears)	0.8	0.5	0.6	0.9	0.7	0.5	0.5	0.7	0.6
WG Jig/Other Pacific Cod	-	-	-	-	-	-	-	-	-
WG Longline Pacific Cod	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1
WG Pot Pacific Cod	0.2	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
WG Trawl Pacific Cod	1.4	0.7	0.9	1.2	0.9	2.6	-	1.2	1.6
WG Offshore Pollock	0.3	-	0.3	-	0.0	-	-	0.2	0.0
WG Inshore Pollock	0.0	0.0	0.1	0.0	0.0	0.0	-	0.0	0.0
WG Rex Sole (All Gears)	-	0.0	0.6	0.2	0.4	0.3	0.1	0.3	0.3
WG Rockfish (All Gears)	0.0	0.3	0.2	0.0	0.0	0.1	-	0.1	0.0
WG IFQ Sablefish	0.5	0.0	0.1	0.0	0.7	0.1	0.0	0.2	0.3
WG Trawl Sablefish	-	-	-	-	-	0.9	-	0.8	0.9
WG Shallow-water flatfish (All Gears)	**12.9**	3.5	3.3	0.7	**35.8**	2.5	-	**5.9**	**11.8**
IRIU Flatfish Discards as Percent of Total Groundfish Catch in Central Gulf Subarea Fisheries									
CG Arrowtooth (All Gears)	0.7	0.7	1.5	0.1	0.0	0.6	0.3	0.7	0.5
CG Atka Mackerel (All Gears)	-	-	-	-	-	-	-		
CG Deep-water Flatfish (All Gears)	0.8	0.7	1.1	0.0	0.9	0.1	0.1	0.7	0.6
CG Flathead Sole (All Gears)	1.1	0.3	1.0	0.2	-	0.1	0.0	0.6	0.0
CG Offshore Pacific Cod (All Gears)	0.5	0.2	**9.6**	0.5	0.2	0.4	0.5	0.4	0.4
CG Inshore Pacific Cod (All Gears)	1.1	0.5	1.5	0.5	0.4	0.3	0.6	0.8	0.5
CG Jig/Other Pacific Cod	-	-	-	-	-	-	-	-	-
CG Longline Pacific Cod	0.0	0.0	0.1	0.1	0.4	0.0	-	0.1	0.2
CG Pot Pacific Cod	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.1	0.2
CG Trawl Pacific Cod	1.8	0.7	2.1	0.8	0.7	0.9	0.9	1.2	0.8
CG Offshore Pollock	-	-	-	-	-	1.8	-	0.4	1.8
CG Inshore Pollock	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0
CG Rex Sole (All Gears)	0.3	0.1	0.3	0.2	0.0	0.3	0.1	0.2	0.1
CG Rockfish (All Gears)	0.9	0.4	0.3	0.0	0.2	0.2	0.3	0.3	0.2
CG IFQ Sablefish	0.0	-	0.0	0.0	0.1	0.0	0.1	0.0	0.1
CG Trawl Sablefish	0.0	2.0	-	-	-	-	-	0.6	-
CG Shallow-water Flatfish	**8.8**	4.9	**5.7**	2.4	4.3	1.5	2.7	4.3	2.2
IRIU Flatfish Discards as Percent of Total Groundfish Catch in Eastern Gulf Subarea Fisheries									
EG Arrowtooth (All Gears)	-	0.5	-	-	-	0.1	-	0.0	0.0
EG Atka Mackerel (All Gears)	-	-	-	-	-	-	-		
EG Deep-water Flatfish (All Gears)	0.2	0.1	0.3	-	0.6	0.1	0.0	0.3	0.4
EG Flathead Sole (All Gears)	-	0.1	0.1	-	-	-	-	0.1	-
EG Offshore Pacific Cod (All Gears)	-	-	-	-	-	-	-	-	-
EG Inshore Pacific Cod (All Gears)	-	-	0.2	**15.8**	0.1	-	0.0	4.3	0.0
EG Jig/Other Pacific Cod	-	-	-	-	-	-	0.1	0.1	0.1
EG Longline Pacific Cod	-	-	-	-	0.2	-	-	0.1	0.1
EG Pot Pacific Cod	-	-	-	-	-	-	0.1	0.1	0.1
EG Trawl Pacific Cod	-	-	0.7	**18.9**	-	-	0.1	**10.5**	0.0
EG Offshore Pollock	-	-	0.6	-	-	-	-	0.4	-
EG Inshore Pollock	-	0.0	0.0	-	-	-	-	0.0	-
EG Rex Sole (All Gears)	0.4	1.0	0.6	-	-	-	-	0.7	-
EG Rockfish (All Gears)	0.0	0.2	0.0	0.0	0.0	-	-	0.0	0.0
EG IFQ Sablefish	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EG Trawl Sablefish	-	-	-	-	-	-	-	-	-
EG Shallow-water flatfish (All Gears)	-	-	0.2	-	-	2.0	-	0.9	2.0
IRIU Flatfish Discards as Percent of Total Groundfish Catch in GOA-wide Fisheries									
GOA Other Groundfish (All Gears)	-	0.0	1.2	-	0.0	-	-	0.4	0.0

Source: NMFS Blend Data, 1995-2001.

Notes:

1) Shaded cells with black text indicate the years in which discards of IR/IU flatfish exceed 5 percent of total groundfish catch.
2) Averages shown in the last two columns are weighted averages of available data.

Table 68 shows the BSAI fisheries that would not be exempt regardless of which of the two methods is used to calculate the discard rate—they are the Pacific cod fishery, flathead sole fishery, rock sole fishery and yellowfin sole fishery. These fisheries accounted for over 96 percent of IR/IU flatfish catch and 93 percent of IR/IU flatfish discards in the BSAI since 1995. It is important to note that if exemption regulations accounted for differences in fishing patterns between trawl catcher processors that are or are not AFA-eligible, the Pacific cod fishery prosecuted by AFA-eligible trawl catcher processors would be exempt.

Table 68. IR/IU Flatfish Discards in Non-Exempt BSAI Fisheries, 1995-2001

								Average	
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**95-01**	**99-01**
BSAI Rock Sole Fisheries (CDQ & Non-CDQ)									
Total Groundfish Catch (1,000s MT)	58.9	45.0	64.5	25.1	27.7	47.0	29.6	42.5	34.8
Total Catch of IR/IU Flatfish (1,000s MT)	36.1	24.4	40.1	14.4	17.5	32.0	17.8	26.0	22.4
Total IR/IU Discards (1,000s MT)	15.5	9.3	16.3	6.4	8.3	15.2	4.0	10.7	9.2
IR/IU Discards as pct. of IR/IU Flatfish Catch	43.0	38.0	40.6	44.4	47.3	47.4	22.8	41.1	40.9
IR/IU Discards as pct. of Total GFSH	**26.4**	**20.6**	**25.2**	**25.5**	**29.9**	**32.3**	**13.7**	**25.2**	**26.4**
BSAI Yellowfin Sole Fisheries (CDQ & Non-CDQ)									
Total Groundfish Catch (1,000s MT)	175.7	174.2	249.6	146.0	105.1	116.2	98.0	152.1	106.4
Total Catch of IR/IU Flatfish (1,000s MT)	116.0	125.7	186.4	99.9	73.7	78.8	60.0	105.8	70.8
Total IR/IU Discards (1,000s MT)	26.3	28.1	37.9	21.5	16.0	13.4	7.4	21.5	12.3
IR/IU Discards as pct. of IR/IU Flatfish Catch	22.7	22.3	20.4	21.5	21.7	17.0	12.4	20.3	17.3
IR/IU Discards as pct. of Total GFSH	**15.0**	**16.1**	**15.2**	**14.7**	**15.2**	**11.5**	**7.6**	**14.1**	**11.5**
BSAI Flathead Sole Fisheries (CDQ & Non-CDQ)									
Total Groundfish Catch (1,000s MT)	10.6	24.6	20.6	37.2	32.0	38.5	29.2	27.5	33.2
Total Catch of IR/IU Flatfish (1,000s MT)	2.1	6.7	3.5	8.8	6.2	8.4	4.7	5.8	6.4
Total IR/IU Discards (1,000s MT)	1.1	3.4	2.2	5.5	3.7	2.9	1.1	2.8	2.5
IR/IU Discards as pct. of IR/IU Flatfish Catch	53.7	50.7	63.2	62.8	59.9	34.0	22.8	49.3	39.6
IR/IU Discards as pct. of Total GFSH	**10.6**	**13.8**	**10.6**	**14.8**	**11.5**	**7.5**	3.6	**10.3**	**7.6**
BSAI Trawl Catcher Vessel Pacific Cod Fisheries									
Total Groundfish Catch (1,000s MT)	60.6	73.4	76.6	39.8	43.1	47.8	21.6	51.9	37.5
Total Catch of IR/IU Flatfish (1,000s MT)	6.6	7.0	7.3	2.5	4.4	1.8	0.8	4.3	2.3
Total IR/IU Discards (1,000s MT)	6.0	6.6	7.2	2.5	4.4	1.7	0.8	4.2	2.3
IR/IU Discards as pct. of IR/IU Flatfish Catch	**90.2**	**95.0**	**99.5**	**100.0**	**100.0**	**98.5**	**99.6**	**96.5**	**99.6**
IR/IU Discards as pct. of Total GFSH	**9.8**	**9.0**	**9.4**	**6.4**	**10.2**	3.6	3.5	**8.1**	**6.1**
BSAI Trawl Catcher Processor Pacific Cod Fisheries									
Total Groundfish Catch (1,000s MT)	55.9	40.1	54.9	35.9	43.3	34.3	28.4	41.8	35.3
Total Catch of IR/IU Flatfish (1,000s MT)	8.0	5.2	8.3	4.2	6.3	7.6	5.1	6.4	6.3
Total IR/IU Discards (1,000s MT)	5.9	3.2	5.6	2.9	4.2	4.8	2.4	4.1	3.8
IR/IU Discards as pct. of IR/IU Flatfish Catch	74.0	61.7	67.7	69.1	66.2	63.6	47.8	65.1	60.2
IR/IU Discards as pct. of Total GFSH	**10.5**	**8.0**	**10.3**	**8.0**	**9.6**	**14.1**	**8.6**	**9.9**	**10.8**

Source: NMFS Blend Data, 1995-2001.

Notes:

1) Shaded cells with black text indicate the years in which discards of IR/IU flatfish exceed 5 percent of total groundfish catch.
2) Shaded cells with white text indicate the years in which discards of IR/IU flatfish exceed 85 percent of total IR/IU Flatfish catch.
3) Averages shown in the last two columns are weighted averages of available data.

The cost and revenue effects of this alternative on the various sectors that participate in groundfish fisheries are similar to the effects of Alternative 1. The main difference between the two alternatives is that the operations of catcher processors, catcher vessels and shore plants in GOA fisheries would likely be unaffected under Alternative 4.

3.4.1.5 Preferred Alternative

The Preferred Alternative is a combination of Alternatives 3 and 4, resulting in a two-step process as follows: Step 1 would delay implementation of full retention requirements for flatfish in the BSAI until June of 2004, while Step 2 would develop alternative means to accomplish bycatch (discard) reductions, while maintaining the economic viability of the fleet participating in these fisheries. Implementation of IR/IU flatfish regulations would begin as scheduled in 2003 in the GOA, where adverse impacts are not expected to be significant. The following trailing amendments will be analyzed with the expectation that these amendments could augment or replace IR/IU regulations for flatfish prior to the end of the delay period.

> **Amendment A:** Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs). This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.
>
> **Amendment B:** Create flatfish bycatch (discard) limits for the flatfish fisheries. Once a bycatch limit is attained, 100 percent retention of flatfish would be required. The purpose of this amendment is to ensure that discarding of flatfish does not increase. In addition, the amendment provides a mechanism whereby discards of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue.
>
> **Amendment C:** Establish a minimum groundfish retention standard such that each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. Each vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.
>
> **Amendment D**: Establish a regulatory process for the routine review of flatfish discards in the BSAI and GOA fisheries and the exemption of fisheries with less than a 5 percent bycatch of IR/IU flatfish from flatfish retention and utilization rules.

Additional details regarding the trailing amendments, including decision points developed by the NPFMC's IR/IU Technical Committee, are provided in Appendix A. Amendment D is similar to Alternative 4 considered in this analysis, but it would refine the mechanisms by which fisheries can be added or removed from the exemption list.

The economic effects of implementing IR/IU rules in the GOA fisheries are described above in Alternative 1 (Section 3.4.1.1). The effects of the regulations on the revenues and costs of the harvesting and processing sectors involved in the GOA fisheries are expected to be minimal. Some HT-CP vessels, especially the smaller boats, will likely be forced to exit or, at the very least decrease their participation in, the GOA Pacific cod and shallow-water flatfish fisheries. However, these fisheries account for less than 2 percent of the gross revenues of the HT-CP sector. It is likely that any income losses that displaced HT-CP vessels incur can be at least partially offset by switching to other fisheries. In addition, it is also possible that HT-CP vessels that elect to stay in the GOA fisheries could reduce the adverse economic effects of IR/IU rules by avoiding fishing grounds that yield large amounts of unmarketable IR/IU flatfish. Delaying implementation of IR/IU flatfish regulations in the BSAI fisheries will postpone the severe economic impacts of the regulations on participants in these fisheries. As discussed in

Alternative 1, the most significant of these economic impacts is a decrease in the gross revenues and/or an increase in the operating costs of small head and gut trawl catcher processors. Postponing these consequences of implementing IR/IU flatfish regulations in the BSAI fisheries will allow the benefits of the economic activity associated with the operations of the HT-CP fleet to accrue to vessel operators, crew and fishing communities for the period of the delay.

In addition to the immediate effects of implementation in the GOA, it is expected that the additional 18 months before implementation in the BSAI will provide industry, and the managing agencies, time to develop measures that can meet bycatch reduction needs, while allowing the industry to continue to provide fishery benefits to the nation.

3.4.2 Changes in Fleet Size and Composition

The potential economic impact of the status quo on some sectors of the groundfish fisheries of the BSAI and GOA creates the possibility that some entities currently participating in these fisheries might be forced to discontinue their participation due to the excessive economic burden the rules could place on their operation. HT-CP vessels, in particular, would be adversely affected because of their heavy reliance on revenues generated in Pacific cod, rock sole and yellowfin sole fisheries.

It is important to note that the HT-CP sector has already felt the effects of numerous regulatory initiatives. The fisheries targeted by HT-CP vessels are frequently closed before the TAC is attained because the fleet reaches the prohibited species catch limits. The NPFMC recently approved a suite of further reductions of incidental catch limits for red king crab and bairdi Tanner crab and created a new incidental catch limit for opilio Tanner crab. In addition, over the last few years thousands of square miles in the Bering Sea have been closed to trawling in an effort to protect crab populations. Some of these areas were prime fishing grounds for the rock sole and yellowfin sole fisheries. The full retention requirement for Pacific cod and pollock, implemented in 1998, had large consequences for smaller trawl vessels because prices for headed and gutted pollock seldom cover the costs of producing this product on small processing vessels. Finally, the HT-CP fleet has been substantially affected by the imposition of expansive closed areas for protection of Steller sea lions and their habitat. Economic losses experienced by the fleet are thought to be a consequence of the increased inability of the fleet to avoid harvests of prohibited species when forced to fish outside of Steller sea lion critical habitat

The status quo alternative will further impair the ability of HT-CP vessels to continue to operate profitably. Under the status quo, smaller HT-CP vessels are the most likely to be forced to exit or decrease their participation in Pacific cod, rock sole and yellowfin sole fisheries because of their very limited product hold capacity. Vessels displaced from these fisheries by the status quo may increase their participation in fisheries targeting Atka mackerel and rockfish. However, these fisheries may not be viable alternatives for smaller HT-CP vessels and are already fully subscribed. Displacing effort from flatfish target fisheries, to Pacific cod and Atka mackerel fisheries, will impose additional economic and operational burdens (e.g., crowding externalities, shortened seasons, smaller average catches per vessel) on fishermen who currently utilize those resources.

Should smaller HT-CP vessels be forced to exit the Pacific cod, rock sole and yellowfin sole fisheries, larger HT-CP vessels that are less constrained by hold capacity and have room for equipment to produce fish meal may be able to increase their share of the harvest in these fisheries. It is also possible that AFA-eligible catcher processors would be in a position to replace the HT-CP vessels that exit the fisheries. For example, surimi and fillet trawl catcher processors are typically larger than HT-CP vessels and less constrained by hold capacity. Moreover, most surimi trawl catcher processors already have plants that produce fish meal from a portion of their retained bycatch and offal. The ability of these vessels to make fish meal out of the fish they catch means that they may have an easier time adjusting to the status quo than the HT-CP boats. However, the target flatfish fisheries may be of limited economic value and interest to the larger surimi and fillet trawl catcher processors. These fisheries tend

to be less profitable than pollock and Pacific cod fisheries in which surimi, "deep-skin" fillets, and other high-value products can be produced.

All of the surimi and fillet trawl catcher processors that participate in the Pacific cod and yellowfin sole fisheries are AFA-eligible vessels. Consequently, they are also constrained from shifting additional fishing effort into these fisheries by so-called AFA sideboard restrictions. These restrictions are specifically designed to limit the participation by AFA-eligible vessels in non-pollock groundfish fisheries to the level that the AFA pollock fleets harvested historically from 1995 though 1997. At the beginning of the fishing year, NMFS determines which BSAI fisheries have inadequate sideboard amounts to support a directed fishery by AFA-eligible catcher processors. Since 1999, the fisheries that NMFS has determined have sufficiently large catcher processor sideboards to support a directed fishery are Akta mackerel, Pacific cod, rock sole, other flatfish and yellowfin sole. The following tonnages were the 2002 AFA sideboard limits for the catcher processor fleet in the BSAI: Pacific cod - 26.3 percent of the available cod or 11,434 mt; yellowfin sole - 23.3 percent or 17,032 mt; and rock sole - 7.3 percent or 3,351 mt. In 2001, none of these limits were reached by the AFA-eligible vessels. It is possible that the cooperative fishing groups formed by the AFA-eligible fleet could facilitate the ability of the most efficient harvesters to participate in these fisheries. For instance, certain vessels could be selected through bylaw agreements and group fishing plans to harvest the sector sideboard allocation.

The composition of the fleet could also be affected should the status quo alternative be implemented concurrently with allocations of groundfish resources to specific gear types. Pot, jig, and small scale longline gears have not proven effective for the flatfish fisheries in the BSAI. Hence, the potential for an allocation among these gear sectors appears unlikely at this time. In the Pacific cod fishery small pot and jig vessels have demonstrated an ability to take a significant portion of the catch if it is set aside for those vessels. For example, the State of Alaska's Board of Fish recently approved a regulation to set aside up to 25 percent of the Federal total allowable catch of Pacific cod to vessels that use pot and jig gear.

3.4.3 Effects on Consumers from Changes in Groundfish Production

Most flatfish, by volume, are headed and gutted, often with the roe left intact. A large percentage of flatfish are frozen whole, while a small percentage, primarily yellowfin sole, are made into kirimi, a steak-like product. Approximately 80 percent to 90 percent of the sole harvested in the Alaska groundfish fisheries is shipped to Asia. Under guidelines of the Office of Management and Budget, changes in consumer surpluses attributable to a proposed action which accrue to persons (or firms) from other than the United States are excluded from the benefit and cost calculations performed in an impact assessment. Consequently, the focus here is on the effects of the proposed action on U.S. consumers.

U.S. consumers would be negatively affected if the status quo resulted in an increase in the price of sole or other groundfish in the domestic market. The increase in price that would occur would depend on, among other things, how responsive the price consumers are willing to pay is to changes in the quantity of fish supplied, as well as, the price, availability, and quality of substitute sources. Very little empirical information is available, at this time, as to the responsiveness of demand for groundfish species and product forms. Past studies have indicated that the price elasticity of demand for groundfish products is fairly high (NMFS 2001b). Headed and gutted fish harvested by Japanese and Korean vessels from Russian waters is increasing competition in the marketplace. Consequently, the per unit price for headed and gutted fish would probably rise only if there were a large decrease in the amount of this product supplied to the domestic marketplace by U.S. firms. The most likely result of a decrease in the domestic production of headed and gutted fish would be a negative effect on the trade balance, as imports increase to offset the reduced supply. If retail market supplies are not expected to change, due to ready availability of imports, a given regulatory action may have little or no impact on U.S. consumers.

3.4.4 Monitoring and Enforcement Issues

A significant issue raised by NMFS is the question of enforceability of IR/IU flatfish regulations. One difficulty centers on the lack of observer coverage in some parts of the fleet. In the HT-CP sector 16 of the 25 vessels have 100 percent observer coverage, while nine are observed only at 30 percent levels. Similarly, only 16 percent of the 203 trawl catcher vessels active in 1999 and 2000 are required to have 100 percent observer coverage, 61 percent have observers at the 30 percent level and 23 percent have no observer coverage.

It is possible that unobserved vessels may discard when not observed, and it is not clear that there is any way to enforce a full retention regulation on unobserved vessels. NMFS can compare fish tickets of unobserved catcher vessels to fish tickets of observed vessel and make inferences about compliance, but it will be very difficult to prove that discarding has occurred. Similarly, NMFS can compare weekly processing report data of unobserved catcher processors to weekly report data of observed vessels and make similar inferences, but, once again, proving a case will be difficult.

IR/IU flatfish rules will be even more difficult to enforce if some discards are allowed (as in Alternative 2). When full retention is required, any observed discarding would be an offense. However, when retention requirements are less than 100 percent, it becomes very difficult to know when the allowable discard amount has been surpassed. This is particularly true in fisheries where IR/IU flatfish are not the target. The observer sampling protocol in multi-species fisheries calls for "basket sampling" in order to estimates species composition, and there are typically no scales onboard HT-CPs or trawl catcher vessels for the estimation of total groundfish weight. Currently, NMFS calculates an aggregate species composition for a given target fishery in a given area by combining observer reports from all observed vessels participating in the fishery over time. NMFS is confident that the sampling protocols are sufficient to estimate total catch for the fishery by species. However, sampling protocols are not likely to be robust enough to accurately estimate species composition and total catch during any given week on a given vessel or on a given trip. This is particularly true if a vessel is changing targets during the week or trip. Without an accurate vessel-by-vessel estimate of total catch and species composition it will be difficult to enforce IR/IU regulations that allow some level of discards.

Also of concern to NMFS is the implications of having observers directly involved in calculating enforceable discard limits. Doing so may require observers to assume an enforcement role that is not consistent with objectives of the observer program.

In the case of a regulation (like Alternative 4) that exempts fisheries with discard rates of IR/IU flatfish that are less than 5 percent, enforcement may require that vessels "clear" with NMFS before moving into fisheries with a different IR/IU exemption status. For example, if an AFA catcher processor wished to switch from operating in the exempt pollock fishery to the non-exempt Pacific cod fishery, they might have to first inform NMFS. Presumably, NMFS would reserve the right to inspect the holds of the vessel before the switch was made to be sure that any Pacific cod retained in the pollock fishery is counted and separated from Pacific cod harvested in the Pacific cod target fishery. This would allow enforcement officers to verify that IR/IU flatfish caught in the Pacific cod target fishery are associated with the correct amount of Pacific cod and not diluted with cod harvests from the pollock fishery.

Alternatively, NMFS may require a vessel that wishes to switch between exempt and non-exempt fisheries to first offload all product. This would ease the accounting burden and ensure that discards of IR/IU flatfish are associated with the correct target fishery. It would, however, impose direct economic costs (e.g., running time, forgone fishing time, off-loading and cold storage expenses), as well as, logistical and operational burdens on the operator to comply.

Compliance with the 15 percent minimum processing standard may also be difficult to monitor. This standard would require that each IR/IU flatfish caught be processed to the established minimum level—not the "average" fish. It might be possible to create new products to meet the IR/IU utilization

requirement, but these products would have to be approved by NMFS before they could be used. For example, it might be worth creating a product that could be the output of a discard grinder. This product would have a base product recovery rate of possibly 80 percent (20 percent loss due to water reduction), but operators could put a shunt in their discard chute to retain 20 percent of the output of the discard chute for a net recovery rate of 16 percent. However, this operation would have to be monitored to ensure that product is pulled out continuously. Furthermore, the operator would then have to store this "new" product (utilizing valuable limited hold/freezer capacity) and then find a buyer for the output, upon landing. If a viable market cannot be developed, the operator would have to incur additional costs to hold increasing amounts of unsalable product and, at some point, pay to dispose of it in a landfill, or by dumping it at sea.

3.4.5 Summary of Benefits and Costs to the Nation and Non-Economic Considerations

The discarding of fish is an economic problem only if it precludes higher valued uses of fish. The IR/IU flatfish caught and discarded in Alaska groundfish fisheries have little or no economic value for the vessels catching them, nor do they have significant commercial, recreational, or subsistence value for anyone else who might catch them. The value of the discarded fish as a protein resource that could be used by hunger relief organizations also appears to be very limited. Furthermore, it is unlikely that many people would assign substantial non-consumptive or non-use values to these fish, if they were left undisturbed in the ocean, and there is no evidence that they have a significant indirect value (e.g., providing prey for other living marine resources that do have use or non-use value). In short, the harvest and discard of these fish in the amounts currently occurring in the groundfish fisheries does not appear to result in any lost economic benefits to society.

On the other hand, as indicated in the analysis above, a requirement to retain all IR/IU flatfish will impose a significant economic hardship on certain segments of the fishing industry. Head and gut trawl catcher processors, in particular, would experience a substantial decrease in gross revenues and/or increase in operating costs. If HT-CP vessels are forced out of the fisheries in which IR/IU flatfish are targeted or caught incidentally, a larger share of the TACs in these fisheries would be available to other segments of the groundfish harvesting sector. However, it is uncertain to what extent these other segments could benefit by shifting their fishing effort. The target flatfish fisheries tend to be less profitable than, say, pollock fisheries. Moreover, AFA sideboard measure restrict the harvest levels of AFA-eligible vessels in non-pollock fisheries, including those fisheries in which IR/IU flatfish are caught.

In conclusion, while distributional impacts across fishing industry sectors are certainly implied by the alternative actions considered, overall net benefits to the Nation may only be slightly affected, if at all, by the alternatives, although the ability to quantify those effects is limited. One could argue that the IR/IU flatfish discarded in Alaska groundfish fisheries should continue to be discarded, because they have little instrumental value to current members of society. What's more, the costs to certain sectors of the fishing industry of retaining them (or avoiding catching them by not fishing) are substantial.

It is important to note, however, that there may be societal concerns related to the discarding of fish that lie outside the economic-utilitarian paradigm. Specifically, some individuals may consider discarding fish to be wasteful and morally wrong. According to this viewpoint, fish that cannot be utilized should not be harvested. There are a number of variants of this philosophy. For example, some people may hold the view that nature has rights; to exploit nature is just as wrong as to exploit people. Other persons may contend that non-human species are intrinsically valuable, independent of any use they may be to humans. The latter conviction may be related to religious principles, such as a belief in the sacredness of all or certain life forms. Still other individuals may simply have an undefined sense that uselessly killing life forms is improper behavior and should be avoided.

It is difficult to gauge how prevalent such ethically motivated values are among members of the American public. However, to the extent that such values are widely held, the high level of discards of IR/IU flatfish represents an important social policy issue that the NPFMC may choose to address.

4.0 Consistency with Other Applicable Laws

4.1 Executive Order 12866

Based on results of the RIR, the Council has concluded that the proposed action will not have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E. O. 12866. Therefore, the Council has determined that this action will not have a significant impact under E.O. 12866.

4.2 Consistency with National Standards

Below are the ten National Standards contained in the Magnuson-Stevens Act (Act) and a brief discussion of the consistency of the proposed action and alternatives with those National Standards, where applicable.

National Standard 1 requires that "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry;" where "optimum yield" is defined in terms of the amount of fish which will provide the greatest overall benefit to the Nation.

The fisheries in which IR/IU flatfish are targeted or caught incidentally will continue to be managed to achieve TACs without overfishing. Stocks of IR/IU flatfish in the BSAI and GOA are not currently in danger of overfishing and are considered stable. Overall yield in terms of flatfish catch will not be affected by any of the actions considered.

In terms of achieving 'optimum yield' from the fishery, the Act defines "optimum" as the amount of fish which: a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; b) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

The effects of the proposed action and alternatives on the revenues and costs of various sectors of the groundfish fisheries are discussed in Section 3.9.1. While distributional impacts across fishing industry sectors are certainly implied by certain alternatives, overall net benefits to the Nation may only be slightly affected, although the ability to quantify those effects is limited.

National Standard 2 requires that "conservation and management measures shall be based upon the best scientific information available."

Information in this analysis represents the most current and comprehensive set of information available. Some data that would have been useful in the analysis (such as operational costs) are unavailable.

National Standard 3 requires that "To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination."

All of the alternative actions considered appear to be consistent with this standard. The BSAI and GOA IR/IU flatfish stocks will continue to be managed as single stocks.

National Standard 4 requires that "Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."

The preferred alternative would not allocate or assign fishing privileges to individual or groups of fishermen, nor would it discriminate among fishermen based on residency or any other equivalent criteria.

National Standard 5 requires that "Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose."

The analysis presents information relative to the perspective of economic efficiency, but does not point to a preferred alternative in terms of this standard.

National Standard 6 requires that "Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches."

None of the alternative actions considered will likely reduce the flexibility of fishery managers or fishermen to respond to variations among groundfish stocks.

National Standard 7 requires that "Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication."

All of the alternative actions, except retention of the Status Quo, under consideration appear to be consistent with this standard.

National Standard 8 states that "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks) take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities."

Many of the coastal communities in Alaska and the Pacific Northwest participate in the Alaska groundfish fisheries in one way or another, whether it be as sites for shore-side processors or support businesses or as the harbor/home port of fishermen and at-sea processing workers. Major ports in Alaska that process groundfish catch from the BSAI and GOA include Dutch Harbor, Akutan, Sand Point, King Cove and Kodiak. Additionally, the Seattle area in Washington is homeport to many catcher and catcher processor vessels operating in these fisheries. Summary information on these coastal communities is provided in the 2001 DPSEIS (NMFS 2001a).

In terms of potential impacts resulting from IR/IU regulations for flatfish, the analysis reviewed data on 1) harvest levels by vessels in each sector; 2) price and revenues resulting from that harvest; 3) where those harvests are delivered for processing or for first wholesale (in the case of catcher processors); and 4) the home port of vessels engaged in the fisheries in which IR/IU flatfish are targeted or caught incidentally. Most of this information is presented in Section 2.0, with additional analysis in Section 3.0.

National Standard 9 requires that "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch; and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."

This analysis assesses alternative actions to increase retention and utilization of yellowfin sole, rock sole and shallow-water flatfish in groundfish fisheries in the GOA and BSAI. Section 2 presents information on historical patterns of IR/IU flatfish discards in the groundfish fisheries in which flatfish are targeted or caught incidentally. Nonetheless, with respect to these specific flatfish resources, there is a tension between "minimizing bycatch" and deriving economic value from these fish stocks (i.e., permitting viable directed fisheries). The preferred alternative seeks to balance these contradictory concerns.

National Standard 10 requires that "conservation and management measures shall, to the extent practicable, promote the safety of human life at sea."

All of the alternative actions considered appear to be consistent with this standard. None of the alternatives would change safety requirements for fishing vessels.

4.3 Section 303(a)(9) - Fisheries Impact Statement

Section 303(a)(9) of the Magnuson-Stevens Act requires that any plan or amendment include a fishery impact statement which shall assess, specify and describe the likely effects, if any, of the conservation and management measures on a) participants in the fisheries and fishing communities affected by the plan or amendment; and b) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants take into account potential impacts on the participants in the fisheries, as well as participants in adjacent fisheries.

Impacts to participants in fisheries in which IR/IU flatfish are discarded are the topic of Section 3.0. The analysis showed that the burden of IR/IU rules will tend to fall most heavily upon the smallest, least diversified fishing operations, especially smaller catcher processors. The head and gut trawl catcher processors will be the most adversely affected because of their heavy reliance on revenues generated in Pacific cod, rock sole and yellowfin sole fisheries. The physical limitations of these vessels could make adaptation to, and compliance with, the IR/IU rules effectively impossible.

Impacts to other fisheries could potentially result from a change in the retention requirements for IR/IU flatfish, as vessels that suffer economic hardship from those requirements may move into other fisheries in an attempt to make up lost revenues and/or reduce operating costs. Larger and more operationally diversified vessels that are less constrained by a full retention requirement for IR/IU flatfish (e.g., large catcher processors with onboard fish meal plants) may choose to exert additional effort in fisheries in which IR/IU flatfish are caught.

Major ports in Alaska that process groundfish catch from fisheries affected by IR/IU rules include Dutch Harbor, Akutan, Sand Point, King Cove and Kodiak. Additionally, the Seattle area in Washington and communities along the northern Oregon coast are homeports to the majority of catcher and catcher processor vessels operating in these fisheries.

The proposed measure would implement IR/IU rules for flatfish in the GOA fisheries beginning in 2003 and delay implementation of these IR/IU rules in the BSAI fisheries through June 2004. The effects on fishery participants and fishing communities of implementing IR/IU rules in the GOA fisheries are minimal. Some HT-CP vessels, especially the smaller boats, will likely be forced to exit or decrease their participation in the GOA Pacific cod and shallow-water flatfish fisheries. However, these fisheries account for less than 2 percent of the gross revenues of the HT-CP sector. Delaying implementation of IR/IU regulations in the BSAI fisheries will postpone the severe economic impacts of the regulations. The postponement will allow the benefits of the economic activity associated with these fisheries to

accrue to vessel operators, crew and fishing communities for the period of the delay. Furthermore, the delay will provide industry, and the managing agencies time to develop measures that can meet bycatch reduction needs, while allowing the industry to continue to provide fishery benefits to the nation.

4.4 Initial Regulatory Flexibility Analysis (IRFA)

4.4.1 Analysis Requirements

The Regulatory Flexibility Act (RFA), first enacted in 1980 and codified at 5 U.S.C. 600-611, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are 1) to increase agency awareness and understanding of the impact of their regulations on small business; 2) to require that agencies communicate and explain their findings to the public; and 3) to encourage agencies to use flexibility and to provide regulatory relief to small entities.

The RFA emphasizes predicting significant adverse impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action. When an agency publishes a proposed rule, it must prepare and make available for public review an Initial Regulatory Flexibility Analysis (IRFA) that describes the impact of the proposed rule on small entities. When an agency publishes a final rule, it must prepare a Final Regulatory Flexibility Analysis (FRFA). Analysis requirements for the IRFA and FRFA are described below in more detail. In the case of the issues and alternatives considered in this analysis, the NPFMC will make recommendations for the preferred alternative, and NMFS will develop proposed regulatory amendments to implement the NPFMC's preferred alternative. Prior to publishing the proposed rule, the IRFA presented here will be completed to reflect analysis of the NPFMC's preferred alternative.

The IRFA must contain:

1. A description of the reasons why action by the agency is being considered;
2. A succinct statement of the objectives of, and the legal basis for, the proposed rule;
3. A description of, and where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
4. A description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
5. An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
6. A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the Magnuson-Stevens Act and any other applicable statutes and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:
    a. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
    b. The clarification, consolidation or simplification of compliance and reporting requirements under the rule for such small entities;
    c. The use of performance rather than design standards;
    d. An exemption from coverage of the rule, or any part thereof, for such small entities.

The "universe" of the entities to be considered in an IRFA generally includes only those entities, both large and small, that can reasonably be expected to be directly regulated by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis.

In preparing an IRFA, an agency may provide either a quantifiable or numerical description of the effects of a proposed rule and alternatives to the proposed rule or more general, descriptive statements if quantification is not practicable or reliable. Currently, insufficient quantitative economic information exists on the fishery under review to determine the economic significance of this action. In the absence of such quantitative social and economic data, a qualitative-based Initial Regulatory Flexibility Analysis is conducted below to comply with the RFA.

4.4.2 Definition of a Small Entity

The RFA recognizes and defines three kinds of small entities: 1) small businesses; 2) small non-profit organizations; and 3) and small government jurisdictions.

Small businesses: Section 601(3) of the RFA defines a "small business" as having the same meaning as a "small business concern," which is defined under Section 3 of the Small Business Act. A "small business" or "small business concern" includes any firm that is independently owned and operated and not dominate in its field of operation. The U.S. Small Business Administration (SBA) has further defined a "small business concern" as one "organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor... A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture."

The SBA has established size criteria for all major industry sectors in the U.S. including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of $3.5 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation and employs 500 or fewer persons on a full-time, part-time, temporary or other basis at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $3.5 million criterion for fish harvesting operations. Finally, a wholesale business servicing the fishing industry is a small business if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned

and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) A person is an affiliate of a concern if the person owns or controls, or has the power to control 50% or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) If two or more persons each owns, controls or has the power to control less than 50% of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors or general partners control the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint venturers if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations: The RFA defines "small organizations" as any nonprofit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions: The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

4.4.3 Reason for Considering the Proposed Action

For many years the NPFMC has explicitly debated issues of bycatch and economic loss from discards in target fisheries. This debate culminated in 1997 with the NPFMC's approval of Amendments 49/49 to the BSAI/GOA FMPs. The result was that, beginning in 1998, all groundfish vessels were required to retain all Pacific cod and pollock and, beginning in 2003, all rock sole and yellowfin sole in the BSAI and shallow-water flatfish in the GOA. However, as the time for implementation of the second portion of the amendments approached, the NPFMC realized that 100 percent retention of IR/IU flatfish would result in severe economic losses to certain fishery participants without concomitant economic benefits to the Nation.

4.4.4 Objectives of the Proposed Rule

The goal of the proposed rule is to provide the NPFMC and the affected industry with additional time to develop and assess alternatives to address groundfish discards in the groundfish fisheries of the BSAI. The objectives are further elucidated in the NPFMC's problem statement presented in Section 1.1.

4.4.5 Legal basis for the Proposed Rule

In 1976, Congress passed into law what is currently known as the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). This law authorized the United States to manage its fishery resources in an area extending from 3 to 200 nautical miles off its coast (termed the Exclusive Economic Zone). The management of these marine resources is vested in the Secretary of Commerce and in regional fishery management councils. In the Alaska region the North Pacific Fishery Management Council is responsible for preparing management plans for marine fishery resources requiring conservation and management. The National Marine Fisheries Service, an agency within the

National Oceanic and Atmospheric Administration of the U.S. Department of Commerce, is charged with carrying out the federal mandates with regard to marine fish. The NMFS Alaska Regional Office and Alaska Fisheries Science Center research, draft and review the management actions recommended by the Council.

4.4.6 Number and Description of Affected Small Entities

A detailed description of the entities affected by the IR/IU flatfish rules is provided in Section 2.2 of this document and is summarized here.

The IR/IU rules for flatfish would apply to all vessels fishing for groundfish in the BSAI and GOA, regardless of vessel size, gear type or target fishery. However, significant amounts of IR/IU flatfish discards occur in only certain groundfish fisheries. The following data for 2000 show the number and type of vessels or shore plants that discarded IR/IU flatfish and the fisheries in which these discards occurred (note that individual vessels or plants may have participated in more than one fishery):

- 24 head and gut trawl catcher processors – 23 in the BSAI "other flatfish" fishery; 9 in the BSAI pollock fishery; 24 in the BSAI Pacific cod fishery and BSAI yellowfin sole fishery; 23 in the BSAI rock sole fishery; 22 in the GOA Pacific cod fishery; and 5 in the GOA shallow-water flatfish fishery.
- 4 surimi and fillet trawl catcher processors – 4 in the BSAI Pacific cod fishery and BSAI yellowfin sole fishery.
- 20 shore plants – 5 BSP-SPs in the BSAI Pacific cod fishery; 8 APAI-SPs in the BSAI yellowfin sole fishery; and 7 K-SPs in the GOA shallow-water flatfish fishery.
- 182 catcher vessels – 22 TCV BSP $\geq$ 125, 40 TCV BSP 60-124, 15 TCV Div. AFA, 6 TCV Non-AFA and 1 TCV < 60 in the BSAI Pacific cod fishery; 2 TCV BSP $\geq$ 125, 1 TCV BSP 60-124, 16 TCV Div. AFA, 31 TCV Non-AFA and 45 TCV < 60 in the GOA Pacific cod fishery; and 1 TCV BSP 60-124, 1 TCV Div. AFA and 6 TCV Non-AFA in the GOA shallow-water flatfish fishery.

None of the head and gut trawl catcher processors or surimi and fillet trawl catcher processors that discarded IR/IU flatfish in 2000 meet the definition of small entity. All of these vessels either have annual receipts in excess of $3.5 million and/or are owned by businesses with annual receipts in excess of $3.5 million.

None of the six BSP-SPs that discarded IR/IU flatfish meet the definition of small entity. All of these seafood processors employ 500 or more persons on a full-time, part-time, temporary or other basis, and some of the plants are owned and operated by large multi-national corporations. One of the APAI-SPs and two of the K-SPs affected are small entities. However, all three of these plants had IR/IU flatfish discards that were less than one percent of their total groundfish production. The K-SPs are also not likely to be significantly affected by IR/IU rules because of the availability of a large, cooperatively owned meal plant that serves all of the community's processors.

With respect to the catcher vessel sectors, it is estimated that all but six of the affected vessels had annual receipts less than $3.5 million in 2000 (Table 69). However, the ownership structure of many of these vessels is uncertain. Some of the catcher vessels are owned by single-boat, family-owned companies, particularly those boats in the TCV < 60 sector. On the other hand, many of the vessels are affiliated with a larger parent company. Consequently, it is possible that this IRFA overestimates the number of small entities that will be regulated under the proposed IR/IU action.

Table 69. Participation and Gross Revenues of Catcher Vessels in Affected Fisheries, 2000

	Vessels Active in Affected Fisheries	Revenue in All Fisheries of Affected Vessels	Revenue in Affected Fsheries	Affected Fishery Revenue % of Total Revenue of Affected Vessels	Maximum Revenue of Affected Vessels	Mean Revenue of Affected Vessels	Vessels with Revenue less than $3 Million
TCV BSP ≥ 125	26	64.35	3.70	5.75	4.35	2.47	21
TCV BSP 60-124	42	78.44	10.45	13.32	3.32	1.87	41
TCV Div. AFA	31	26.74	10.37	38.78	1.50	0.86	31
TCV Non-AFA	37	16.25	6.07	37.37	1.29	0.44	37
TCV < 60	46	13.56	5.60	41.31	0.74	0.29	46

4.4.7 Relevant Federal Rules that may Duplicate, Overlap, or Conflict with the Proposed Action

No duplication, overlap or conflict between this action and existing Federal rules has been identified.

4.4.8 Measures Taken to Reduce Impacts on Small Entities

The proposed action would mitigate the adverse economic effects of IR/IU rules for flatfish on small entities by delaying implementation of these IR/IU rules in the BSAI fisheries through June 2004. The postponement will allow the benefits of the economic activity associated with these fisheries to accrue to vessel operators, crew and fishing communities for the period of the delay. Furthermore the delay will provide industry, and the managing agencies time to develop measures that may meet bycatch reduction needs, while allowing the industry to continue to provide fishery benefits to the nation.

4.4.9 Potential Impacts of the Alternatives on Small Entities

The specific economic impacts of the proposed action and alternatives on both large and small entities in each sector of the groundfish fishery are addressed in detail in Section 3.9 of this document and are summarized here.

The IR/IU rules for flatfish under the status quo will impose direct operational costs that probably cannot be offset (in whole or in significant part) by expected revenues generated by the sale of the additional catch. No quantitative estimate can be made of these costs at present. In general, the impacts on any operation will vary inversely with the size and configuration of the vessel, hold capacity, processing capability, markets, and market access, as well as the specific composition and share of the total catch of the IR/IU flatfish.

The burden will tend to fall most heavily upon the smallest, least diversified operations, especially smaller head and gut trawl catcher processors. The ability of these vessels to adapt to the IR/IU rules will be further limited due to such regulatory actions such as the vessel moratorium, License Limitation Program and Coast Guard load-line requirements that place severe limits on reconstruction to increase vessel size and/or processing capacity. According to industry representatives, smaller HT-CP vessels would be placed at a significant competitive disadvantage to larger vessels and would likely be forced to exit or decrease their participation in fisheries with high levels of IR/IU flatfish discards because of the vessels' very limited product hold capacity (Northern Economics, Inc. 2002). However, none of these smaller trawl catcher processors meet the definition of small entity. All of these boats either have annual receipts in excess of $3.5 million and/or are owned by businesses with annual receipts in excess of $3.5 million.

The proposed action would mitigate the adverse economic effects of IR/IU rules for flatfish on participants in the Alaska groundfish fisheries by delaying implementation of these IR/IU rules in the BSAI fisheries. The postponement will allow the benefits of the economic activity associated with these fisheries to accrue to vessel operators, crew and fishing communities for the period of the delay. The effects on small entities of implementing IR/IU rules in the GOA fisheries are minimal. Some HT-CP vessels, especially the smaller boats, will likely be forced to exit or decrease their participation in the GOA Pacific cod and shallow-water flatfish fisheries. However, these fisheries account for less than 2 percent of the gross revenues of the HT-CP sector.

No significant additional Federal reporting or record keeping requirements are included in the proposed IR/IU rules. Implementation of this amendment will require the record keeping and reporting of additional IR/IU species. While this will increase the need for species separation and enumeration it is not considered to be a significant increase in paperwork. Harvesters and processors in the groundfish fisheries are already subject to a plethora of reporting and record keeping requirements (NMFS 2002). The most germane of these reporting and record keeping requirements are daily logbooks. Harvesters are required to daily summarize the results of individual tows including gear, time, location, depth, target species, total weight delivered, and discard species and weight. Catcher processors are required to daily report time, location, depth, gear, target species, total weight caught, Pacific cod and pollock IR/IU catch weight by species, discard species and weight and product information by species, product type and weight. At-sea and shore-based processors are required to report delivery information, Pacific cod and pollock IR/IU weight by species, discard species and weight and product information by species, product type and weight.

Alternative 1, which represents a 100 percent retention, would lead to decreases in gross revenue for the affected fisheries and could yield substantial decreases in gross revenue associated with rock sole in the Pacific cod fishery. Assuming hold space is limited, the additional flatfish retained would displace fish of higher value, thereby decreasing per trip revenues. The problem of damaging non-flatfish, such as Pacific cod, by mixing rough-scaled flatfish and soft-fleshed roundfish in the hold may be a problem for many of the catcher vessels. This problem may be avoided if flatfish are segregated in a separate hold. However, most catcher vessels are unlikely to be able to dedicate an entire hold to the relatively small amount of flatfish that are likely to be taken. Furthermore, it is generally reported that many (perhaps most) of these catcher vessels do not have the capacity to sort their catch at sea, under any circumstance. Historical catches and discards of IR/IU flatfish by trawl catcher vessels are highest in the BSAI Pacific cod fishery, both in terms of volume and percent by weight of retained groundfish. During the 1992-2000 period, discards of RSOL and YSOL were 12.6 percent of the total amount of groundfish retained. In the same period, discards of SFLT in the GOA Pacific cod fishery were only 1.6 percent of total retained groundfish, while discards of SFLT in the SFLT target fishery were 9.8 percent of the total amount of groundfish retained. Over 75 percent of trawl catcher vessel gross revenue was generated from landings of pollock and 20 percent was generated in Pacific cod fisheries. Only 3 percent of trawl catcher vessel gross revenue was generated from landings of flatfish. Moreover, since 1998, flatfish have accounted for only 1 percent of total gross revenue. Clearly, pollock and Pacific cod are the mainstay of trawl catcher vessels, and because bottom trawling for pollock was prohibited in 1999, IR/IU flatfish regulation are likely to affect only those trawl catcher vessels that participate in Pacific cod fisheries. An exception to this generalization may be found among those vessels that participate in the relatively small SFLT fishery.

Alternative 2 would allow some discards of the IR/IU flatfish species. The percent retention requirement would be set independently for each species and would range from 50 percent to 90 percent. The analysis of the effects of alternative retention requirements on catcher vessels shows that virtually 100 percent of the catch of BSAI RSOL and BSAI YSOL is discarded in all the fisheries in which BSAI RSOL and BSAI YSOL are caught. Consequently, any retention requirement for BSAI RSOL or BSAI YSOL would be expected to result in adverse economic and operational impacts. Even a 100 percent

retention requirement for these IR/IU flatfish species will have a minor economic impact on catcher vessels in terms of discards as a percent of the weight of groundfish retained in 2000. This measure can be interpreted as a displacement of revenue tonnage. A full retention requirement for BSAI RSOL would have the greatest effect, and this requirement would result in less than a five percent displacement in revenue tonnage for all catcher vessel classes. The economic effect of any GOA SFLT retention requirement on catcher vessels is also likely negligible.

Alternative 3 would delay implementation of IR/IU flatfish rules for up to 3 years. Delaying implementation will postpone the severe economic consequences discussed under Alternative 1 and will allow the benefits of the economic activity associated with the operation of these vessels to accrue to vessel operators for the period of the delay. A delay in implementation could also provide time for assessment of the potential for rationalization within the IR/IU flatfish fisheries. These fisheries are characterized by a "race for fish" mode of operation that exacerbates the economic impacts of the IR/IU rules. Rationalization may ease some aspects of the "race for fish", but may not eliminate all aspects because IR/IU flatfish are targeted during specific roe seasons and times of highest quality. However, possibilities for fleet consolidation or cooperative operations that might ease the economic burden of IR/IU flatfish rules could be explored during a delay in implementation. In the past several years, discards of GOA shallow-water flatfish and BSAI yellowfin sole have been trending downward. Industry sources indicate that they have been doing all that they can to utilize all the IR/IU flatfish that they harvest and are actively attempting to develop markets for smaller fish.

Alternative 4 exempts fisheries from IR/IU flatfish regulations if flatfish discards are less than 5 percent of total groundfish catch. This analysis used two different estimates of the discard rates for determination of the IR/IU exemption—one estimate is based on a weighted average discard rate for 1995-2001, and a second estimate is based on a weighted average discard rate for 1999-2001. Discards exceed 5 percent (shaded cells in the right-most column) in most flatfish fisheries and in Pacific cod trawl fisheries in the BSAI, but in the GOA, only in the very small Western Gulf Shallow-water flatfish fishery. The revenue reductions of this alternative are similar to those of Alternative 1. The main difference between the two alternatives is that the operations of catcher vessels in GOA fisheries would likely be unaffected under Alternative 4.

The preferred alternative would implement IR/IU flatfish regulations in the GOA fisheries, beginning in 2003, and delay implementation of IR/IU flatfish regulations in the BSAI fisheries, through June 2004. The economic impact of the preferred alternative on individual vessels is expected to be minimal. As discussed above in Alternative 1, discards of shallow water flatfish in the GOA Pacific cod fishery were only 1.6 percent of total retained groundfish representing an approximate 1.6 percent reduction in gross revenue of the target Pacific cod. Although not directly impacting vessels, the analysts point out that in addition to the immediate effects of implementation in the GOA, it is expected that the additional 18 months before implementation in the BSAI will provide industry, and the managing agencies, time to develop measures that can meet bycatch reduction needs, while allowing the industry to continue to operate effectively.

In conclusion, we cannot quantify the exact number of small entities that may be directly regulated by the proposed action. However, because the proposed action has a minimal economic impact on participants in the GOA groundfish fisheries and postpones any adverse economic impact on participants in the BSAI groundfish fisheries, no small or large entities are expected to be significantly adversely affected by this action.

4.5 Coastal Zone Management Act

Implementation of each alternative would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Management Program within the meaning of Section 30(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

4.6 Executive Order 12898

Executive Order 12898 focuses on environmental justice in relation to minority populations and low-income populations. The U.S Environmental Protection Agency (EPA) defines environmental justice as the "fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies." This executive order was spurred by the growing need to address the impacts of environmental pollution on particular segments of society. The E.O. requires each Federal agency to achieve environmental justice by addressing "disproportionately high and adverse human health and environmental effects on minority and low-income populations." The EPA responded by developing an Environmental Justice Strategy that focuses the agency's efforts in addressing these concerns.

In order to determine whether environmental justice concerns exist, the demographics of the affected area should be examined to determine whether minority populations and low-income populations are present, and if so, a determination must be made as to whether implementation of the alternatives may cause disproportionately high and adverse human health or environmental effects on these populations. Environmental justice concerns typically embody pollution and other environmental health issues, but the EPA has stated that addressing environmental justice concerns is consistent with NEPA and thus all Federal agencies are required to identify and address these issues.

Many of the coastal communities in Alaska and the Pacific Northwest participate in the Alaska groundfish fisheries in one way or another, whether it be as sites for shore-side processors or support businesses or as the harbor/home port of fishermen and at-sea processing workers. Major ports in Alaska that process groundfish catch from the BSAI and GOA include Dutch Harbor, Akutan, Sand Point, King Cove and Kodiak. Additionally, the Seattle area in Washington is homeport to many catcher and catcher processor vessels operating in these fisheries. A discussion of the relative importance of fisheries to these regions and communities and profiles of their populations are included in the 2001 DPSEIS (NMFS 2001a). Overall, the population structures of these regions vary considerably, but in the Aleutian and Kodiak regions there are predominant Alaska Native and other minority populations. Kodiak is about 13 percent Native. The predominant minority in the city and its surroundings is Asian and Pacific Islanders, followed by Natives and African-Americans. In King Cove and Sand Point, Alaska Natives make up about 48 percent and 44 percent of the populations, respectively, with Asian and Pacific Islanders the next largest minority population.

While Washington and Oregon's relationship to the Alaska groundfish fisheries is more involved than some regions of Alaska (in terms of absolute number of jobs), it could be argued that the fisheries are less important or vital than for the Alaskan communities considered. For example, the size of Seattle dilutes the overall impact of the Alaska groundfish fishery jobs, whereas in Alaskan communities such jobs represent a much greater proportion of the total employment in the community. Thus, while nearly all of the head and gut trawl catcher processors affected by IR/IU rules for flatfish are homeported in Seattle, any impacts on this community's minority or low-income populations due to changes in the operations of these vessels will be minimal.

The proposed action does not appear to have any significant individual or cumulative environmental or human health effects. Thus, no minority population or low-income population (or any other distinct population) would be disproportionately affected in this regard.

5.0 References

Auster, P. J. and R. W. Ludwig, 1999. The effects of fishing on fish habitat. *Fish habitat: Essential Fish Habitat and Rehabilitation*, L. R. Benaka, ed., American Fisheries Symposium, Bethesda, MD, pp. 150-187.

Clark, W. G. and S. R. Hare, 2002. Assessment of the Pacific Halibut Stock at the End of 2002. *International Pacific Halibut Commission Report of Assessment and Research Activities 2001*.

National Marine Fisheries Service (NMFS), 1998. *Supplemental Environmental Impact Statement for Groundfish Total Allowable Catch Specifications and Prohibited Species Catch Limits Implemented Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish of the Gulf of Alaska*. NOAA, NMFS, Alaska Region, Juneau.

_____, 2000. Guideline for economic analysis of fishery management actions. NOAA, NMFS, Office of Sustainable Fisheries, Silver Spring, MD.

_____, 2001a. *Alaska Groundfish Fisheries: Draft Programmatic Supplemental Environmental Impact Statement*. NOAA, NMFS, Alaska Region, Juneau.

_____, 2001b. *Steller Sea Lion Protection Measures Supplemental Environmental Impact Statement*. NOAA, NMFS, Alaska Region, Juneau.

_____, 2001c. *Total Allowable Catch Specifications for the Year 2002 Alaska Groundfish Fisheries*. NOAA, NMFS, Alaska Region, Juneau.

_____, 2002. *Recordkeeping and Reporting Requirements, Reference Manual: Federal Groundfish Fisheries of the Exclusive Economic Zone Off Alaska, Per Regulations Found at 50 CFR Part 679*. NOAA, NMFS, Alaska Region, Juneau.

Northern Economics, Inc., 2002. *Assessment of Changes in IR/IU Flatfish Requirements*. Report prepared for the North Pacific Fishery Management Council, Anchorage.

_____ and EDAW, Inc., 2001. *North Pacific Groundfish Fisheries Sector and Regional Profiles—2001*. Report prepared for NOAA, NMFS, Alaska Region, Juneau.

6.0 List of Agencies and Agency Personnel Contacted

NOAA-Fisheries Alaska Region, Sustainable Fisheries Division

Sue Salveson, Kent Lind, Dr. Lewis Queirolo

NOAA-Fisheries Alaska Region, Fisheries Enforcement Division

Jeff Passer; Gary Galreaith; Ken Hansen

NOAA-Fisheries Alaska Fisheries Science Center

Dr. Joe Terry, Martin Loefflad

North Pacific Fishery Management Council Staff

Chris Oliver, Dave Witherell, Jane DiCosimo, Diana Evans, Jon McCracken, Maria Shawback

7.0 List of Preparers

Staff of Northern Economics, Inc. including Scott Miller, Marcus Hartley, Dr. Donald Schug, Richard Tremaine, and Terri McCoy.

Appendix A. Additional Details and Decision Points on Proposed Trailing Amendments

Decision Framework for Reviewing and Revising the Trailing Amendments

The following is the generalized decision framework for three of the four proposed trailing amendments (Amendments A – C) that will be assessed and potentially implemented prior to June 2004. Amendment D, the fourth trailing amendment, is similar to Alternative 4. Amendments C and D would be an expedited timeline (i.e., final action by April 2003) and Amendments A and B would be accomplished as soon as practicable. Amendments A-C would be limited to the BSAI fisheries. Amendment D would apply to the BSAI and GOA fisheries.

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives (PSBRCs)

This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations. The amendment would:

- Define a new "Multi-Speices" Trawl CP Fishery in the BSAI
- Include flatfish and Pacific cod fisheries when incidental catch of flatfish exceeds minimum level
- Create separate PSC apportionments of halibut, opilio, bairdi, and king crab for the Multi-species Trawl CP Fishery
- Allow the formation of PSBRCs in the Multi-Species Trawl CP Fishery
- Apportion PSC to coop and open access pools based on groundfish catch history.

Amendment B: Create Bycatch Caps (Discard Caps) for the Flatfish Fisheries

The purpose of this amendment is to ensure that bycatch (discards) of flatfish does not increase. In addition, the amendment provides a mechanism whereby bycatch of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to accrue. This amendment will address the problem of conflicting goals by creating bycatch limits for flatfish—once a limit is attained, 100% retention would be required. Features of the amendment include:

- Application of discard caps to all flatfish fisheries in the BSAI
- Reductions of discard caps could be predetermined in the amendment or frame-worked for an annual specification
- Apportionment of discard caps to vessel pools would be considered

Amendment C: A Minimum Groundfish Retention Standard as an Alternative to Flatfish Retention Requirements

- Establish a minimum groundfish retention standard.
- Under such a standard, each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch.
- For example, if the minimum retention standard was set at 75%, then for each 100 mt of groundfish harvested the vessel must produce a quantity of products that equal 75 mt in round-weight equivalents.
- The vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Amendment A: Establish Prohibited Species Bycatch Reduction Cooperatives

The **purpose** of this amendment is to reduce bycatch of prohibited species by creating regulations that facilitate the creation of Prohibited Species Bycatch Reduction Cooperatives (PSBRC). The **problem** with the current regulations is that they create a disincentive to reduce bycatch—rational fishers are discouraged from reducing bycatch because the benefits derived from the cost they personally incur, are dissipated across all participants in the fishery regardless of whether other fishers have took actions to reduce their bycatch.

The **goal** of the PSBRCs will be to create rational incentives for participants to reduce bycatch of prohibited species. Fishers that choose to reduce their prohibited species bycatch are likely to incur costs in terms of reduced catches, more expensive gear, or longer search times for clean fishing grounds. Fishers who choose not to avoid bycatch do not incur these costs. However, because all PSB in a particular fishery are currently counted against the same cap, clean fishers are shut down at the same time as less-clean fishers. This amendment provides for the allocation of PSC limits between two pools of vessels—one pool for vessels wishing to participate in PSBRCs, and one pool for vessels wishing to remain under the current "race for fish" regime. Vessels in a given pool will be allowed to continue to participate in target fisheries subject to PSC limits as long as the pool's PSC limits have not been attained. Once a pool has attained a particular PSC limit, vessels in that pool will be restricted as per existing PSC regulations.

Vessels participating in the PSBRC will agree to abide by all cooperative rules and requirements. Vessels participating in the open access pool will be subject only to current PSC regulations.

Decision Point 1: Determine the PSC limits that will be included in the PSBRC Program.

1.1 BSAI Trawl CP Multi-Species Halibut Cap consisting of an apportionment of the current Pacific cod trawl cap and the caps for the flatfish fisheries.

1.2 BSAI Trawl CP Multi-species Red King Crab Cap consisting of an apportionment of the current Pacific cod trawl cap and the caps for the flatfish fisheries.

1.3 BSAI Trawl CP Multi-species Snow crab (*c. opilio*) Cap consisting of an apportionment of the current Pacific cod trawl cap and the caps for the flatfish fisheries (includes apportionments of the trawl sablefish/turbot/arrowtooth limits).

1.4 BSAI Trawl CP Multi-species Tanner crab (*c. Bairdi*) Zone 1 Cap consisting of an apportionment of the current Pacific cod trawl cap and the caps for the flatfish fisheries. BSAI Trawl CP Multi-species Tanner crab (*c. Bairdi*) Zone 2 Cap consisting of an apportionment of the current Pacific cod trawl cap and the caps for the flatfish fisheries.

The IRIU Technical Committee (which developed these decision points) indicated its preference that the PSBRC program be limited to BSAI trawl fisheries for Pacific cod and flatfish, and therefore only PSC limits that are relevant to those fisheries would be included. The committee recognized that the PSC limits for halibut in the Pacific cod fishery would need to be explicitly divided between trawl catcher vessels and trawl catcher processors. The committee also discussed the need to further split the Pacific cod limit for halibut into "multi-speices" and "single-species" limits for CPs—this split would recognize the different operating patterns of H&G trawl CPs and other trawl CPs (AFA trawl Cps).

The committee indicated the need to create an aggregate PSC limit that would combine apportionments of the halibut cap that are currently made for the various flatfish fisheries and a new CP apportionment for Pacific cod—the newly created aggregate limit would be applied to the trawl CP "multi-species" flatfish and Pacific cod fisheries. Similar changes would be made for

crab PSC limits as appropriate. Salmon and herring limits would not be affected because they are not binding constraints on the affected fisheries. If at some point in the future, salmon and herring do become more of a constraint on the multi-species fisheries then those PSC limits should be considered for inclusion.

Decision Point 2: How will the PSBRC Program accomplish actual reductions in the amount of prohibited species bycatch?

2.1 Reductions in PSC limits would be accomplished in the normal specification process.

2.2 Reductions in PSC limits would be built into the regulations implementing the program.

2.2.1 A 5 percent reduction in PSC limits would be part of the initial program; or

2.2.2 A 5 percent reduction in PSC limits would be imposed in the second year of the program

This decision point addresses concerns that the PSBRC program may not result in actual reductions in prohibited species bycatch. The original proposal indicated the willingness of PSBRC participants to accept a 5 percent reduction in their apportionment of PSCs. The committee added specific suboptions to the second option that reflects the original proposal's language to incorporate a 5 percent reduction of PSC into the program. One committee formally objected to the lack of a specific option with a schedule of PSC reductions over the duration of the program.

Decision Point 3: How will vessels indicate whether they wish to operate in a PSBRC?

3.1 The decision to participate in the PSCBRC will be made annually. Vessels will indicate whether they will participate in a PSBRC within 10 business days of the final specification of PSC limits by the NPFMC, and will not be allowed to switch between a PSBRC and the PSC-Race during the fishing year.

3.1.1 Catch history of owners that do not indicate they will participate in one or the other pool in the annual process will not be included in the calculation of the PSC apportionments.

3.1.2 Catch history of owners that do not indicate they will participate in one or the other pool in the annual process will be included in the open access PSC apportionments.

3.1.3 Catch history of owners that do not indicate they will participate in one or the other pool in the annual process will be included in the PSBRC PSC apportionments.

Other options discussed would 1) require a decision to join prior to the final specification were set, or 2) require a one-time decision to participate for the duration of the program.

The suboptions shown were implicit in the committee's discussions of the transferability of catch history (Decision Point 1).

Decision Point 4: What is the minimum level of participation in the PSBRC?

4.1 At least 25 percent of the participants in the "multi-species" fishery are required to participate. AFA-CPs that choose to participate are not included in this calculation.

4.2 At least 50 percent of the participants in the "multi-species" fishery are required to participate. AFA-CPs that choose to participate are not included in this calculation.

4.3 At least 75 percent of the participants in the "multi-species" fishery are required to participate. AFA-CPs that choose to participate are not included in this calculation.

4.4 A minimum percentage of the participants in the "multi-species" fishery are required to participate—the appropriate percentage would be determined during the final decision process and would rely on information contained in the analysis.

It is assumed that the percentages in the option pertain to number of vessels in the coop compared to the total number of vessels in the multi-species fishery. An alternative method to calculate participation would be based on the percent of historical catch in the coop and in the fishery as a whole.

Decision Point 5: How will the allocation of PSC limits between PSBRC pools and PSC-Race pools be determined?

5.1 The allocation of PSC limits between pools would be proportional to the total retained catch of groundfish in the multi-species target fisheries of the vessels included in each pool. The catch histories of each vessel that may be able to join the PSBRC will be set at the time of implementation. Those histories will then be applied to whichever pool the vessel in participating.

5.1.1 Total retained catch from 1995-2002 will be used in the calculation

5.1.2 Total retained catch from 1995-2002 will be used in the calculation—each vessel will be allowed to drop its worst year.

5.1.3 Total retained catch from 1995-2002 will be used in the calculation—each vessel will be allowed to drop its worst two years.

5.1.4 Total retained catch from 1999-2002 will be used in the calculation.

5.1.5 Total retained catch from 1995-1997 will be used in the calculation.

5.1.6 Total retained catch from 1995-1998 will be used in the calculation.

There are many ways to set the allocation between PSBRC and PS-Race pools, including purely subjective and purely quantitative methods. The committee favored quantitative methods as in the original proposal. One member of the IRIU Technical Committee could not agree to the inclusion of suboptions 5.1.5 or 5.1.6.

The following is an hyptothetical example of the PSC apportionment method envisioned by the committee based on suboption 5.1.1:

Assume that 15 of the 25 catcher processors in the multi-species fisheries decide to join the PSBRC. From 1995-2002, vessels in the PSBRC retained 592,165 mt of groundfish in multi-species fisheries, while vessels choosing not to participate in the PSBRC had 465,273 mt of retained groundfish. Overall, the PSBRC vessels accounted for 56 percent of the retained catch in multi-species fisheries from 1995-2002. The newly created multi-species halibut PSC cap is set at 2,310 mt (hypothetically calculated as 45 percent of the original trawl halibut PSC cap for Pacifc cod for 2001 and the 100 percent of the halibut PSC cap for yellowfin sole, rock sole, and other flatfish). The PSBRC would be allocated 56 percent of the multi-species halibut PSC cap (1,294 mt), and the "open access" vessels would be allocated 44 percent (1,017 mt).

Decision Point 6: Determination of Vessels to be included in the multi-species catch history pools.

6.1 All catch histories of all vessels that have participated in multi-species fisheries during the catch history period (Decision Point 1) will be included in the multi-species catch history pool. Annual decision to participate will be determined as in Decision Point 1.

6.2 During implementation of the PSBRC Program NMFS will conduct an application process. Owners of record of all vessels that have participated in multi-species fisheries will be asked to submit an application to have their catch history counted in one or the other multi-species pool. Catch histories of vessel owners that do not submit an application will not be included in the multi-species catch history pools. Catch history of owners that do not indicate they will

participate in one or the other pool in the annual process will not be included in the calculation of the PSC apportionments.

This decision point provides an avenue to include or exclude catch histories of vessels that are no longer participating in the multi-species fisheries. Additional options that would require recent participation were not explicitly discuss by the committee, but potentially could be added. This decision point was not explicitly discussed by the committee but was implicit in discussion of catch history transfers (Decision Point 1).

Decision Point 7: Can a vessel participate in a PSBRC for one fishery and a PS-Race for a different fishery?

Creation of multi-species PSC limits for pacific cod and flatfish fisheries essentially eliminates this potential problem. However, appropriate measures would be needed to assure that PSBRC vessels that also participate in other target fisheries such as the Atka mackerel fishery and rockfish fisheries in the BSAI, or that also participate in the GOA, are not able to negatively affect those fisheries. The PSBRC would likely include some AFA-CP vessels that participate in the "single species" Pacific cod fishery as well as the yellowfin sole fishery, and therefore some measures made be necessary for spillover effects created by these vessels.

Decision Point 8: Transferability of Catch History and Decapitalization.

Vessels with catch history included in the multi-species fishery can elect not to participation in the multi-species fisheries. When deciding to exit the fisheries a vessel owner may transfer the vessel's catch history to the owner of a participating vessel. The allocation of these transferred catch histories will be included in one pool or the other pool as per Decision Point 1, however the new owner, rather than the former owner, will be asked to decide the pool to which the catch history will be applied. Additional questions regarding transferability include:

8.1 Can catch history be separated from the vessel, from the LLP?

8.2 Can catch history be subdivided?

8.3 Should there be regulations in the event a limited number of coops form, that exert control over available PSC?

8.4 Should there be options for second generation entry into bycatch cooperatives?

The committee viewed the transfers of catch histories as desirable, particularly within the PSBRC.

Decision Point 9: Is it likely that the PSBRCs will have negative impacts on fisheries that are not included in the program? If so, what measures will be used to curtail or mitigate these impacts?

9.1 Sideboards on harvesting for participating members would be set in regulations, using the same years as used to calculate the apportionment of PSC between the PSBRC and the open access pools.

9.2 Require the PSBRC to have language in contracts that prohibit participants from exceeding their maximum percent of harvests in other target fisheries. Sideboards would not be set in regulation. This part of the program would be discussed in the annual SPBRC report and would be a major component of the review of program by the Council and NOAA Fisheries.

Decision Point 10: PSBRC Internal Rulemaking and Allocations

NOAA Fisheries will establish standards for Internal Cooperative Rulemaking. Evidence of binding private contracts and remedies for violations of contractual agreements must be provided to NOAA Fisheries for the PSBRC to be approved. Participants in the PSBRC must demonstrate an adequate

system for the estimation, monitoring, reporting and overall accounting of the PSC available to the PSBRC.

Decision Point 11: Reporting, Monitoring and Enforcement Requirements and Observer Protocols.

11.1 Specific rules and regulations for monitoring and enforcing PSC limits including observer coverage, sampling protocols, and vessels reporting and record-keeping requirements will be developed in normal rulemaking processes and will not be the purview of the PSBRC. Three components of the program will be developed in separate processes to ensure that goal and objectives of the program are met in a cost effective manner.

11.1.1 inseason monitoring

11.1.2 program evaluation

The committee generally agreed that is not clear that any changes will be necessary to the current program, but if it is determined that, for example, additional observer coverage will be necessary, then options will be developed as appropriate. Kent Lind advised the committee that the appropriate way to determine observer coverage was to first determine the goals and objectives of the observer program for the PSBRC. Following the determination of goals and objectives it is appropriate to examine the costs and benefits of any additional observer coverage. Lind also indicated (and the committee concurred) that it may be appropriate to examine observer coverage requirements from two different perspectives:

1) Observer coverage rules would be based, as in the current system on a boat-by-boat basis, in which each vessel is required to have observers on board for fixed percentage of the time (i.e. 30%, 100%, or 200%--2 observers).

2) Observer coverage rules would be based on an objective that a pre-determined percentage of the aggregate catch would be observed. For example, the program objective might be that 67 percent of the hauls within the PSBRC program are observed, and deployment of observers would be developed to meet that objective.

The committee also discussed the use of alternative monitoring methods. For example, rather than requiring observers to monitor whether or not PSCs were being discarded, video systems could be developed that would automatically transmit recordings on a real-time basis.

Decision Point 12: Review of the PSBRC program

Review of the PSBRC program will be accomplished by requiring a detailed annual report from the PSBRC. NOAA fisheries and the NPFMC will review the annual report and determine if the program is functioning as desired. An in-depth assessment of the PSBRC will be undertaken under the auspices of the Council/NOAA Fisheries after the third year of the program. The study will report the accomplishment of the program and indicate whether any changes are necessary.

12.1 To facilitate review of the program real-time posting of data from the PSBRC will be required.

12.2 To facilitate review of the program, the council should consider recommendations of the economic data committee established for the crab rationalization program.

The technical committee considered review of the program mandatory, however, real-time posting of PSBRC data and collection of economic data were viewed as an optional components of the review program.

Amendment B: Create Bycatch Caps (Discard Caps) for the Flatfish Fisheries

The **purpose** of this amendment is to ensure that bycatch (discards)[2] of flatfish does not increase. In addition, the amendment provides a mechanism whereby bycatch of flatfish in the flatfish fisheries can be systematically reduced over time, while continuing to allow the economic benefits of the fisheries to occur. The NPFMC while, wishing to continue its efforts to reduce bycatch, has determined that imposing 100 percent retention of certain flatfish species is likely to cause significant economic harm to current participants. This amendment will address the **problem** of conflicting goals by creating bycatch limits for flatfish—once a limit is attained, 100% retention would be required.

Decision Point 1: How will specific flatfish bycatch limits be set?

1.1 A schedule of specific limits into the future will be determined within the amendment.

1.2 In the annual specification process

Option 1.1 would create a fixed schedule for flatfish bycatch reduction, while Option 1.2 would provide more latitude for changing conditions.

Decision Point 2: What criteria will be used in setting specific flatfish bycatch limits?

2.1 Historical bycatch and trends

2.2 Biologically based target

2.3 Economically based targets

Decision Point 3: Flatfish discard limits will a part of the following FMPs

3.1 The BSAI Groundfish FMP

Decision Point 4: The flatfish discard limits apply to

4.1 Only those fisheries in which flatfish are the target using current target definitions.

4.2 All multi-species fisheries in which flatfish are at least:

- 4.2.1 5 percent of the total catch.
- 4.2.2 10 percent of the total catch
- 4.2.3 20 percent of the total catch
- 4.2.4 30 percent of the total catch

4.3 All fisheries in which flatfish are caught.

Option 4.1 would exempt multi-species Pacific cod target fisheries from the bycatch limits, while Option 4.3 would include all fisheries, even those in which flatfish incidental catch is deminimus.

[2] In order to be consistent with the MSA, this decision framework uses the term bycatch as defined in the MSA, i.e., that bycatch is fish that is discarded, rather than delivered or processed.

Decision Point 5: Which flatfish species will be included in the flatfish bycatch limits

5.1 All flatfish

5.2 All flatfish except arrowtooth flounder

5.3 Yellowfin sole, rock sole, and flathead sole in the BSAI.

5.4 IRIU flatfish only (yellowfin sole and rock sole in the BSAI).

5.5 The council would determine which flatfish species are included in the flatfish bycatch limits during the annual specification process.

Option 5.1 includes arrowtooth flounder in the bycatch limits even though there are extremely limited markets for arrowtooth. Option 5.3 includes the principle flatfish target species complexes. Option 5.4 includes only those flatfish species included under the current IRIU program. The intent of Option 5.5 is the assignment of included fisheries can be changed as appropriate over time.

Decision Point 6: Will the flatfish limits be aggregate limits or species specific?

6.1 One aggregate bycatch limit is set for all included flatfish species

6.2 Bycatch limits are set independently for each included species.

Species specific bycatch limits may be more difficult to monitor and enforce than aggregate limits. The committee discussed the need to aggregate cap lower than what might be the sum of individual caps, but no consensus was reached. This issue should be part of the analysis.

Decision Point 7: The flatfish bycatch limits will …

7.1 Not be apportioned.

7.2 Be apportioned to relevant target fisheries as necessary from Decision Point 1.

7.3 Be apportioned by season.

Apportioning the bycatch limits may ease concerns that fisheries that occur early in the year will generate enough bycatch that fisheries later in the year will be forced into retain 100 percent retention. The committee discussed the concept of apportioning bycatch caps by FMP sub-areas, and indicated their desire to see bycatch data reported by subarea. However, the committee did not wish to see a specific suboption to apportion bycatch cap by subarea.

Decision Point 8: The system for the estimation, monitoring and reporting of flatfish discards uses

8.1 The current level of observer coverage, sampling protocols and vessel reporting and record-keeping requirements for:

8.1.1 inseason monitoring

8.1.2 compliance to full retention standards after the bycatch limit is met

8.1.3 program evaluation

8.2 Alternative levels of observer coverage, sampling protocols and/or vessel reporting and record-keeping requirements, using boat-by-boat coverage levels for:

8.2.1 inseason monitoring

8.2.2 compliance to full retention standards after the bycatch limit is met

8.2.3 program evaluation

8.3 Alternative levels of observer coverage, sampling protocols and/or vessel reporting and record-keeping requirements, using on an aggregate coverage level basis for:

8.3.1 inseason monitoring

8.3.2 compliance to full retention standards after the bycatch limit is met

8.3.3 program evaluation

Aggregate coverage level imply that NMFS would set observer requirement such that a minimum percentage of the applicable catch was observed.

Decision Point 8 addresses concerns of NOAA Fisheries regarding monitoring and enforcement of flatfish discards. Goals and objectives of the monitoring program should be specified for three components: 1) inseason monitoring, 2) compliance to full retention standards after the bycatch limit is met, and 3) program evaluation—the committee recommended these three components be included as suboptions for each option with the idea that the council could pick and choose among the available options.

Decision Point 9: Can the flatfish bycatch limits be allocated to certain groups or pools

9.1 Allow flatfish bycatch limits to be allocated to pools

9.2 Do not allow flatfish bycatch limits to be allocated to pools

This decision point is included because it is possible that in establishing bycatch limits for flatfish, the same types of problems as seen with PSC limits will arise. These problems may be avoided by treating the flatfish bycatch limits similar to PSC limits and allocating them to groups or pools such as envisioned in the PSBRC Program.

Amendment C: A Minimum Groundfish Retention Standard as an Alternative to Flatfish Retention Requirements

Developing a retention requirement for flatfish species has proven problematic. Analyses have concluded that 100% retention requirements are unviable economically while species-specific partial retention standards are likely to be impossible to monitor or enforce.

One alternative approach would be to establish a minimum groundfish retention standard. Under such a standard, each vessel would be required to retain a certain percentage of their total catch regardless of the species composition of the catch. For example, if the minimum retention standard was set at 75%, then for each 100 mt of groundfish harvested the vessel must produce a quantity of products that equal 75 mt in round-weight equivalents. The vessel would be free to choose which suite of species and products to retain in order to meet the minimum standard.

Such an alternative would be far simpler to monitor and enforce because every vessel must already log the total weight of each haul and must also provide detailed production reports. There would be no need to rely on observer sampling data to monitor compliance because the species composition of the haul would be irrelevant. Compliance monitoring would simply involve comparing the total catch against the vessel's total production for a given period of time.

A minimum groundfish retention standard that is monitored by comparing total catch to total production would create the following incentives in the groundfish fisheries off Alaska, all of which are consistent with the Council's objectives for the IR/IU program:

Increased selectivity in fishing practices. Vessel operators would have a powerful incentive to avoid catching unwanted groundfish species because they would be held accountable for retaining a percentage of their total catch.

Increased utilization of target and non-target species. A general retention standard would encourage vessel operators to find uses for all groundfish species that are currently discarded. In contrast to the existing 100% retention requirement for rock sole and yellowfin sole, which creates no incentive to retain and utilize any other groundfish species, a general retention standard would provide an incentive for vessel operators to retain all of the groundfish species that are practicable for them to retain.

Increased productivity and recovery rates. If the minimum retention standard is enforced using NMFS standard product recovery rates (PRRs), then vessel operators would have an incentive to refine production techniques in an attempt to achieve higher recovery rates than the published standard. Vessels that achieve higher actual PRRs would have higher apparent retention rates than vessels with lower actual PRRs.

Increased incentive to avoid prohibited species. If the minimum retention standard is based on a comparison of total catch to retained products then vessel operators would have increased incentive to avoid PSC. This is because the total weight of PSC in the catch would be counted as part of the total catch weight and a vessel with a high percentage of PSC in the catch would need to retain a higher percentage of groundfish to meet the standard than a vessel that catches little or no PSC.

Current groundfish retention rates for selected BSAI target fisheries

The following tables provide the aggregate groundfish retention rates during 2001 for selected BSAI target fisheries. In the BSAI, groundfish retention rates ranged from a low of 48% for the trawl 'other flatfish' target fishery to a high of 100% for the jig target fisheries.

Table 1. 2001 Groundfish retention rates for selected Bering Sea and Aleutian Islands target fisheries.

		Total groundfish in metric tons			
Gear	***Target***	***Discard***	***Retained***	***Total***	***Retention rate***
Hook & Line	Pacific cod	17,146	101,756	118,902	86%
	Turbot	889	2,737	3,626	76%
	Sablefish	703	1,387	2,090	66%
Jig	Pacific cod	0	72	72	100%
	Atka mackerel	0	2	2	100%
Pot	Pacific cod	643	16,398	17,040	96%
	Sablefish	15	133	148	90%
Trawl	Pollock (midwater)	5,085	1,193,810	1,198,895	100%
	Pollock (bottom)	1,596	22,886	24,482	94%
	Yellowfin sole	27,040	72,344	99,384	73%
	Atka mackerel	11,004	53,421	64,425	83%
	Pacific cod	11,736	39,188	50,924	77%
	Rock sole	9,484	21,121	30,606	69%
	Flathead sole	11,114	19,153	30,267	63%
	Rockfish	1,256	8,457	9,713	87%
	Arrowtooth flounder	789	2,499	3,287	76%
	Other flatfish	501	456	957	48%

Decision Point 1: To which fisheries would the standard apply?

1.1 General retention standard would apply to all fisheries.

1.2 General retention standard would apply to selected fisheries or gear types.

The first decision point in establishing a general groundfish retention standard is determining which fisheries would be subject to the standard. Applying a minimum retention rate to all fisheries would prevent strategic target switching by vessel operators. From the 2001 retention rates displayed in Table 1, it would appear that the flatfish trawl fisheries of the BSAI have the lowest retention rates at present. Consequently, any retention rate standard that is economically practicable for the flatfish trawl fisheries to meet is likely to be easily achievable for other fisheries.

Decision Point 2: Single standard or multiple standards?

2.1 Establish a single minimum retention rate for all target fisheries to which the retention requirement applies.

2.2 Establish a different standard for each target fishery.

Establishing a single minimum retention rate for all target fisheries to which the minimum retention requirement applies has the advantage of simplicity and would avoid any potential for strategic target switching by vessel operators who are attempting to avoid the higher retention rate standard of a particular target fishery. In addition, a single minimum retention rate standard would be far simpler for vessel operators and enforcement officers to track and monitor. The accounting would become significantly more complex if a vessel is operating in multiple target fisheries, each of which has a different minimum groundfish retention standard.

Decision Point 3: On what basis should minimum retention rate standards be set?

3.1 Based on a consideration of catch composition and target retention rates for each species harvested in a target fishery.

3.2 To achieve objective of reducing existing discards by a certain tonnage or percentage relative to status quo.

At least two different methods could be used to establish a minimum groundfish retention rate standard. Under the first option, a minimum retention rate standard for a particular fishery could be established by examining the average catch composition for that fishery and assigning target retention rates for each species. The target retention rates could be weighted and averaged to determine an overall minimum retention rate for that fishery.

A second option would be to establish target reductions in discard rates or discard tonnages for specific fisheries, or for the groundfish fisheries as a whole, and then determine what minimum retention rate is necessary to achieve the objective. Analysis could determine what level of discard reductions could be achieved with different minimum retention rate standards.

Decision Point 4: What should the minimum utilization standard be?

4.1 15% (current standard for pollock, Pacific cod, and flatfish starting in 2003)

4.2 Some other minimum utilization standard.

The current 15% minimum utilization standard was established in 1997 based primarily on a consideration of range of published PRR for pollock primary products. At that time, the lowest published PRR for a primary pollock product was 16% for deep-skin fillets and a 15% minimum utilization standard was thought to be reasonable. This same 15% minimum utilization standard could be applied to retained groundfish in general, or a different minimum utilization rate could be established. Any analysis of a general groundfish minimum retention rate should explore the issue of minimum utilization rates as well. A minimum utilization rate would be easily enforced and monitored. For example, a 15% minimum utilization rate would simply require that for every 100 mt of groundfish harvested, a vessel would be required to produce at least 15 mt of product.

Decision Point 5: Over what period of time and how would the standard be enforced.

5.1 Daily

- 5.1.1 Cumulative running total for the day
- 5.1.2 Final total for the day

5.2 Weekly

- 5.2.1 Cumulative running total for the week
- 5.2.2 Final total for the week

5.3 Fishing trip

- 5.3.1 Cumulative running total for the trip
- 5.3.2 Final total for the trip

5.4 Monthly or Quarterly

5.4.1 Cumulative running total for the month or quarter

5.4.2 Final total for the month or quarter

Because daily catch and production records are maintained on a quarterly basis, the period of time for which the standard would apply could range from daily to quarterly or any period in between. A daily standard would imply that the vessel operator is responsible for achieving the minimum retention rate during every single fishing day. A quarterly retention standard would mean that monitoring and enforcement is based on quarterly catch and production totals without regard to what happened on a particular day or week.

A standard based on cumulative running totals would require that the vessel is in compliance at all times. In other words, it could not start off with retention rates below the standard and catch up later. A standard based on final totals for a period of time would allow a vessel to drop below the standard for a period of time as long as it was able to catch up later.

A daily standard is likely to be unpractical because of the normal lag time between when harvesting and production. Fish harvested on one day are often not processed until the following day, which means that there is no direct relationship between daily catch and daily production on a catcher/processor. Minimum retention standards that are applied over longer periods of time would provide industry with greater flexibility to meet the standard by moving to new fishing areas or changing fishing techniques. Because target fishery categories are determined on a weekly basis, a standard based on different retention rates for different target fisheries would likely need to be applied on a weekly basis to simplify monitoring. However, a uniform standard that applied to all target fisheries could be monitored over any period of time for which records are maintained on board the vessel.

Monitoring and enforcement issues

Monitoring compliance with a general groundfish minimum retention standard would require tracking two pieces of information on each vessel: total catch and total production. All vessels are currently required to log total catch and total production in their daily fishing logs and catcher/processors are also required to submit weekly production reports electronically. In addition, observers also make total catch estimates for hauls that they sample.

Obviously if the minimum retention rate standard is difficult for a particular vessel to meet, that vessel would have an incentive to either under-report total catch or over-report production in order to appear compliant with the standard. Therefore, some level of compliance monitoring is necessary to ensure that vessel operators are neither under-reporting total catch or over-reporting total production.

Monitoring total catch. Over the past decade, various programs have been implemented in different fisheries to improve total catch accounting. Flow scales are required on all AFA and CDQ vessels and other catch estimation methods such as certified bin volumes have been used to estimate total catch. Subsection 313(h) of the Magnuson-Stevens Act also requires the Council to implement measures to ensure total catch measurement in each fishery under its jurisdiction. Any analysis of a minimum groundfish retention standard should examine current methods of total catch measurement in the groundfish fisheries to which the standard would apply to determine whether total catch measurement techniques are adequate to prevent under-reporting.

Monitoring total production. Catcher/processors currently must submit weekly electronic reports of their total production by product and species. In addition, catcher/processors are required to submit product transfer reports each time product is transferred off the vessel. While vessel operators could over-report production in order to appear in compliance with the standard, this could be monitored by comparing a vessel's weekly production reports against it's product transfer reports to determine if the vessel is reporting more production than can be accounted for by product transfers. A vessel also could

over-report product transfers, however one consequence of doing so would be an increase in the vessel's landing tax liability. In addition, catcher/processors that base crew shares on the vessel's total production during a fishing trip could also find themselves liable for increased crew payments if they over-report total production. Therefore, most catcher/processors probably have a financial incentive not to over-report their total production. Any analysis of a general groundfish minimum retention and utilization standard should examine the current system of production reporting to determine if it is adequate to prevent over-reporting of production.